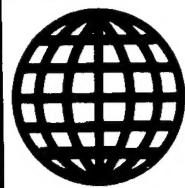


28 May 1993



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# ***JPRS Report***

## **Environmental Issues**

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# Environmental Issues

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**Gorbachev Calls For Global Environmental Conservation**

*OW2004133093 Tokyo KYODO in English 1130 GMT  
20 Apr 93*

[Text] Kyoto, April 20 KYODO—Former Soviet President Mikhail Gorbachev called Tuesday for international efforts to protect the global environment.

He made the remark in a joint news conference with former Japanese Prime Minister Toshiki Kaifu at Kyoto International Conference Hall one day after the launch of the International Green Cross (IGC).

Gorbachev is the first president of the IGC, a nongovernmental organization formed by the U.N.-backed global forum to help relieve artificial environmental disasters.

"The problems of environmental destruction, which are being seen worldwide, cannot be resolved at a national level. It is the role of the International Green Cross to call the attention of national governments to such problems for resolution," Gorbachev said.

He said the group will do research on environmental destruction and call on national governments to take legislative action to preserve the natural environment in cooperation with existing environmental groups.

Gorbachev is scheduled to return to Russia next Sunday after participating in a four-day global forum general meeting and delivering a speech at the Osaka Institute of Technology.

Global forum was founded in 1985 to explore ways to prevent global environmental destruction.

**Lakes Still Contaminated From Chernobyl**

*93WN0410C Stockholm DAGENS NYHETER  
in Swedish 28 Apr 93 p 6*

[Article by Sigrid Boe and Soren Lofvenhaft: "Seven Years After Chernobyl, Half the Fallout Remains"]

[Text] Seven years after the nuclear power accident at Chernobyl, 60 percent of the radioactive fallout still remains in Swedish soil. In the most-affected areas this means that radiation is more than twice as high as normal. It will take more than a hundred years before we reach normal levels again.

"What remains is primarily the isotope cesium-137 which has a half-life of 30 years," explained Leif Moberg, research secretary at the National Institute of Radiation Protection, SSI.

In 30 years the radiation is cut in half, after another 30 years it is cut in half again, and so forth.

Lakes and untilled land are the main problems. The radioactive fallout just lies there at a depth of several

centimeters. On cultivated land the process of plowing, liming, and fertilizing has essentially eliminated the problem.

The radioactive fallout does not represent a health risk to humans until it is assimilated by plants and animals that we eat.

**Problem Fish**

"This involves only the areas that were hardest hit by the fallout, some sections of Gavleborg County and Vaster-norrland County," said Moberg.

These areas still have a high radioactive content, as much as 10,000 or 20,000 becquerels per kilogram, in meat, primarily from roe deer and moose as well as lambs and sheep that graze freely on untilled pastures.

Mushrooms and lake fish are also a problem.

"It may be several decades before some lakes in the area come under the National Food Administration's maximum permissible level for lake fish, 1,500 becquerels per kilogram," Moberg said.

The Food Administration still makes some random checks of wild berries, mushrooms, and wild game sold in stores. But in recent years the results have generally been far below the limit.

The SSI also follows the effects of the fallout from Chernobyl through frequent measurements of ground radiation, carried out partly by plane and partly via a number of permanent measurement stations on the ground in the most affected areas.

**Learning More**

"Right after the accident ground radiation in the hardest hit areas was around four times higher than normal. Today we estimate that it has declined to around twice the level of normal background radiation," Moberg said.

But ground radiation is considerably lower in most parts of the country. The SSI estimates that radiation averages around 60 percent of the level reached just after the accident.

Attempts are now being made through various research projects to use the Chernobyl accident to learn more about the risks from radioactive fallout. And especially the possibilities of preventing damage.

"Today, for example, we can make a fairly good prediction of which lakes will be hit the hardest if a similar accident should occur," Moberg pointed out.

All land and undernourished lakes with little water flowing through are at risk. The researchers are also looking for an explanation of why it takes such a long time before cesium disappears from some animal species, such as roe deer and moose, and certain fish.

**Viter Lake Is Lost**

Hans Bergstrom, who has a house by the shore of beautiful Viter Lake in Gastrikland has given up hope.

"None of us who live here now will see the day when the lake is healthy again and the fish are edible."

Three years ago DAGENS NYHETER visited him as he pulled in his net together with Stig Stolt. After the Chernobyl catastrophe they have both caught fish regularly and sent them to the municipal health safety inspector to have the becquerel content measured.

A perch set the record that year with a content of 79,000 becquerels (Bq) per kg.

"It is not that bad now, but the last figure for perch was 24,000 Bq/kg. The lake is lost. It is sad for those of us who like to fish as a hobby," Hans said.

A weeks or two ago some pike caught in Viter Lake in connection with ice fishing were tested.

**Blacklisted**

"The radioactivity in five fish that were checked lay between 6,230 and 12,400 Bq/kg," said Ake Nygards of the health safety authority in Gavle.

In the spring of 1993 fish from around 25 of the lakes in Gavle municipality are still blacklisted. The becquerel content of the fish is far above the limit of 1,500. But there is no longer any problem in the ocean or in running water, Nygards said.

In Lake Bojtiken in Vasterbotten's mountain district the situation is just as gloomy as it is in Viter Lake.

Birger Larsson told us that the last char sent in for testing contained around 8,000 Bq/kg.

"It varies. Some fish contain considerably lower amounts, around 4,000, but naturally we can't sell any as we did before Chernobyl. In the mountain towns around the lake fish provided a sizable extra income every week as well as food for the families living there.

**Craving for Fish**

"It is disturbing to have such a wonderful lake destroyed. The radioactivity seems more apt to go up than down."

Birger lives near a cove of the lake. Sometimes the craving for fresh fish becomes too strong. He and his wife prepare a char or a salmon trout without worrying about the becquerel content. But the children of Bojtiken now eat fish sticks out of the freezer or fresh fish from far away.

## KENYA

### Moi Says Kenyan Professor Free To Attend Kyoto Meeting

AB2004113593 Nairobi KNA in English  
1730 GMT 19 Apr 93

[Text] The president of the International Green Cross [IGC] Mikhail S. Gorbachev, has sent the following message to President Moi:

"This morning in Kyoto, Japan, I convened the inaugural meeting of the board of trustees of the IGC, a new non-governmental organisation devoted to value changes, environmental disaster relief and advocacy for an international ecological law. My distinguished colleagues on the board of trustees and I were distressed to learn that one of our members, Wangari Maathai, founder of the Greenbelt Movement, has not been able to leave Kenya to [words indistinct] is currently hiding and is having a problem with her passport. We would like to [word indistinct] for your assistance in this matter, and request that you personally intervene to ensure the safe passage of Dr Maathai from Kenya to be able to join us for the remainder of our meeting and then be able to return safely to your country.

"Wangari Maathai, through her outstanding work in mobilising grassroots citizens to plant trees and care for nature, has emerged as a symbol of the introduction of environmental principles into the consciousness and everyday life of people. It was for this reason that we invited her to serve with us, and it is for this reason that we appeal to you to ensure that her unique perspective is represented at this important meeting.

"The board of trustees can be reached via the Kyoto International Conference Hall, the address and fax number for which are listed above."

Meanwhile, in his reply, the president said:

"I have the honour to refer to Your Excellency's fax message of 18th April 1993 in which my personal intervention is sought in ensuring the participation of Prof Wangari Maathai in the ongoing inaugural meeting of the board of trustees of the IGC.

"Indeed, Prof Maathai's travel has not been prevented as she has a passport that would enable her to go anywhere. My government has nothing whatsoever to do with Prof Wangari Maathai's travel arrangements, nor her going into hiding.

"Prof Wangari Maathai is free to go anywhere she wants as she has done in the past.

"Accept Your Excellency, the assurance of my highest consideration."

## LESOTHO

### Minister Urges Staff To Reverse Land Degradation

MB2004113693 Maseru Radio Lesotho in English  
1600 GMT 19 Apr 93

[Text] Lesotho is severely eroded and the situation could be averted if all Basotho could care for their country by planting trees and reclaiming dongas [ditches]. This statement was made by the minister of agriculture, the Honorable Ntsukunyane Mphanya, when addressing the staff of various sections of the ministry at the Agricultural College in Maseru on Friday [16 April].

He, therefore, appealed to the staff of the Department of Conservation and Forestry to utilize all skills at their disposal to reverse the current situation. Mr. Mphanya said that if the current land degradation and dilapidation is not corrected this nation is facing a grim future and that through dedication much could be achieved.

He appealed to the staff of his ministry to use government property and finances to benefit the Basotho who have voted the present government into power. Mr. Mphanya said that the Basotho elected the BCP [Basotholand Congress Party] to be the government in order to improve their lives because of the party's manifesto.

**Qu Geping on Environmental Protection Work in Facing Implementation of Market Economy**

93WN0341A Beijing ZHONGGUO HUANJING BAO  
[CHINA ENVIRONMENTAL NEWS] in Chinese  
18 Feb 93 p 1

[Article by Qu Geping, Director of the State Environmental Protection Bureau]

[Text] The goal of national economic system reform is to build a socialist market economic system. Selection of this target model signals an historic step in the advance of national reform and modernized construction, and it will have a deep and far reaching impact on the various aspects of China's economic and social development.

The environmental protection effort is closely bound to the scale, structure, pace and technical level of economic development. The selection of goals for economic system reform will, therefore, have an impact on the environmental protection effort through its various links with economic development, and generally speaking, the environmental protection effort must center around economic construction, be appropriate to the needs of the socialist market economy, and through its own special laws to positively promote economic development and system reform, effecting a coordinated development of the economy and the environment.

For these reasons, the following actions must now be fully engaged:

First, understanding the connection between the market economy and environmental protection. Building a socialist market economic system means letting the market, under the macroscopic regulation and control of the State, be the underlying force in the disposition of resources, and letting economic activity respond to the law of values. This is very necessary and absolutely correct for strengthening economic activity and for driving economic progress. At the same time, it must be seen that market regulation also has weaknesses, namely that it has its own determined self interests, blind spots, and side effects, which easily lead to economic vicissitudes, and is prone to vagaries and environmental pollution, what economists and development experts call "market ineffectiveness." The 14th National Party Congree (NPC) report has cautioned that "the market has its own weaknesses and negative aspects which must be watched, and it is imperative that State macroscopic regulation and control be strengthened and improved."

Analyzing the issue of environmental pollution. In a market economy, enterprises, on which the market is built, are managed independently and are responsible for gains and losses, and because they depend on themselves for their profits, they seek to maximize economic efficiency and profits and give very little consideration to long range effects on the environment and resources, with the result that pollution is passed on to the society, and that unavoidably produces a series of environmental problems. Western developed countries have discovered

these results through the process of developing their market economies, after which, they then adopted strong state intervening policies, strengthened laws, set up strong environmental protection and control organizations, and established strict supervisory systems which abated the pollution or made environmental improvements. Historical practice shows that they have been successful because the governments took charge of the matter and the environment was improved, and that illustrates the principle of "Economic development relies on the market, and environmental supervision relies on the government."

Therefore, in the economics of developing a socialist market economy, it is absolutely essential that the government take a strong hand in environmental control, and the business of arbitrarily relegating supervision and control authority, relaxing supervision, or simply dismissing environmental protection organization, is from the point of view of supporting reform, very one-sided and detrimental. And, it is also contrary to the need to strengthen environmental protection as expressed by the 14th NPC.

Second, continue to strengthen and improve environmental supervision and control. China regards "strengthening environmental management" as central to the overall environmental policy, and that was established and developed through more than 10 years of reform. During this period, the idea of reforming China's economic system by expanding the scope of market regulation steadily progressed. Overall, the evolution of the environmental protection effort in China has been consistent with establishing a socialist market economic system, and it is also concurrent in progress. For a long time to come, the existing environmental protection policy will still be basically adoptable, and should continue to be thoroughly upheld. At the same time, in practice it should also be constantly improved and developed. For example, the eight-point environmental protection control system in place at present across the country is the collective embodiment of the practical application of China's specific and general environmental protection policies proven through extensive practice to be effective control measures. Under the conditions of the market economy, it is clearly even more urgent and important to persevere in this effective control system.

Along with that, the policies and system, like any other policies and systems, respond to objective conditions, and require timely readjustments. Facing the new circumstances of a socialist market economy, there must be a systematic check and inventory of the contents of the policies, regulations, and standards of all past formulated and implemented policies, rescission and revision of those parts no longer suitable, and more appropriate policies promptly put in their place.

Third, The environmental protection effort must work in the market mechanism. There are various ways to apply environmental management: legal, administrative,

economic, educational, etc. Looking particularly at governmental functions as the primary means of environmental management, administrative management methods must then, of course, be strengthened, and various countries around the world now generally operate in this way. The eight-point system of China's environmental protection management is basically all administrative measures, except for the collection of fees for discharging pollutants (if emission licenses can be negotiated on the market, then they are economic measures). From the perspective of China's actual situation, the administrative management approach to the organizational and control system must be strengthened. But, this is not to say that environmental management obviates the need for economic measures. On the contrary, furthering environmental protection actions under the conditions of deepening market economy requires use the market mechanism, and even greater use of economic measures. This approach is more beneficial to improving distribution of resources, makes enterprises accelerate the pace of technological transformation, saves energy, reduces consumption, and increases economic gains and environmental rewards.

Economic measures should be applied mainly through the principle of repayment in resources; set down economic policies that support relevant compensations in environmental resources, as in some areas where raw materials are produced (such as coal); study a number of preferential policies for supporting environmental protection, such as preferential loans to encourage pollution control, comprehensive use, and natural protection work. Attention must also be given to study and digest good domestic and foreign practices already in effect, such as negotiating discharge rights, waste water discharge fees, the "three at the same time" cash guarantees, cash pledges for waste, subsidies for model engineering and similar economic measures.

How to properly conduct the environmental protection effort under the conditions of a market economy is still a new question in China, and China must be ready to learn from developed countries that have already had much successful experience. China's environmental protection effort has a good foundation, and policies have been formulated that are well in keeping with China's national characteristics, and China continues to be genuinely interested in further advancing environmental protection under the conditions of a market economy.

(An English draft of this article will be prepared for "Peace" magazine.)

### Significant Reform in Industrial Pollution Control Strategy

93WN0341B Beijing ZHONGGUO HUANJING BAO  
[CHINA ENVIRONMENTAL NEWS] in Chinese  
25 Feb 93 p 1

[Article by reporter Liu Xiaojun [0491 2556 6511]]

[Text] In the process of setting up a market economic system, and carrying out the policy of "Prevention first", the implementation of total processing controls on industrial pollution and insistence on clean production are responsibilities that cannot be dodged. This was the consensus of industrial experts and environmental workers at the recently held Symposium for China's Industrial Pollution Prevention and Control Strategy for the 1990s.

This symposium, held at Ma'anshan, Anhui, was an important preparation for the upcoming 2nd National Industrial Pollution Prevention and Control Working Conference. The purpose was, in the new context of furthering reforms and openness, integrating conversion of management mechanism in enterprises, changing the functions of government, and establishing a socialist market economic system, to study and explore the management strategy and goals for the future national industrial pollution prevention and control effort, the questions of management systems and operating mechanisms, aspects of technical and economic policy, in order to open new lines of thinking and provide a basis for determining national policy.

At the symposium, Deputy Director of the State Environmental Protection Bureau, Wang Yangzu, suggested raising the policy of "Prevention first" to the pinnacle of the strategy for industrial pollution prevention and control, promoting clean production, and urging industries and enterprises to better integrate the pollution prevention and control with their economic interests, and energize the internal pollution prevention and control dynamics of industries and enterprises. He said that within the processes of the socialist market economy there must be a further perfection of industrial pollution control systems and operational mechanisms, definition of the responsibilities of the various levels of government and the chief industrial management departments and industries and enterprises, for protecting the environment and preventing pollution, and while insisting that environmental protection departments unify supervision and control, the supervision action by the masses must also be strengthened.

To deepen the policy of "Prevention first", the symposium, in reviewing the foundation of the national industrial environmental protection technical policy, introduced model industrial pollution prevention and control systems and frameworks for technical policy, and even outlines for methods and practices for clean production, raising policy suggestions for furthering analysis of forms of 1990s industrial pollution prevention and control, efficient use of energy resources such as clean coal, etc., and other considerations concerning China's industrial pollution prevention and control technical and economic policies.

### Nationwide Water-Saving Campaign Launched

40101012C Beijing CHINA DAILY (National)  
in English 3 May 93 p 3

[Text] Saving water in cities—that is the theme of a nationwide campaign to be launched in the first week of next month.

The Ministry of Construction hopes the activities will arouse the public's awareness of water shortages and encourage people to be careful in the use of water.

Zhou Ganzhi, Vice-Minister of Construction, speaking at a recent international workshop on urban water conservation, said China plans links on this issue with international organizations, including the United Nations Development Programme and the World Bank.

He hoped for international support.

China is a country with insufficient water resources. About 300 cities suffer from water shortages.

Even in cities where water saving campaigns have been carried out for many years, water shortages remain one of the major problems affecting the city's economic and social development.

Zhou said the government has been successful in water-saving. In many places, the increase in water use has slowed down compared with the economic growth rate.

But the vice minister said more must be done to protect water resources and to ensure the rational use of water.

Wang Guangtao, director in charge of urban construction under the Ministry of Construction, said there have been water savings made in the past 10 years.

Since the country introduced its water conservation programme to cities, some 10.2 billion cubic metres of water have been saved; the industrial water recycling rate has grown from around 20 to 50 percent.

Wang said the country would accelerate legislation and tighten up administrative supervision this year.

Beijing is to strengthen its water conservation administration to achieve the goal of saving 52 million cubic metres of water a year.

The municipal administration department is set to renovate 300 industrial water saving projects, raising the industrial water recycling rate to above 82 percent.

The municipal, district and county saving water offices will regularly inspect at least 36,500 households for their water consumption.

Meanwhile, water projects in some rural areas have also been taking place.

The water crisis in Henan Province has been eased, and about 680,000 people and 185,000 animals are now provided with sufficient drinking water, China Environmental News reported.

Henan's water construction project has been the biggest in its history. It attracted huge investment and benefited many.

The hill areas in Henan Province were hit by the century's worst drought between August 1990 and July 1992.

About 80 percent of rivers and ponds were dry. This caused a water crisis in 83 counties, affecting 4.3 million residents and 1.2 million animals.

Because of shortage of water, some schools closed, some township enterprises had to stop production and many cattle were killed or sold to save water.

Vice-Premier Tian Jiyun and officials from State departments went to inspect the disaster area and demanded that local governments guarantee that no one die from hunger, thirst or cold.

The State Council also plans to allocate some 50 million yuan (\$8.7 million) between 1992 and 1995 to construct drinking water projects for mountain people.

### Japan Loan Used To Buy Boilers for Thermal Power Plant

40101014A Beijing CHINA DAILY in English  
8 May 93 p 2

[Article by staff reporter Lao Zhang: "Japan Loan Buys Boilers for Thermal Power Plant"]

[Text] Huaneng International Power Development Corporation yesterday signed an agreement to borrow \$22.5 million from Japan's Sanwa Bank to import German-made boilers for a large thermal power plant in Beijing.

This is the first overseas loan for Huaneng this year. Further foreign loans are expected, so the construction of more major power projects can be hastened.

Electricity shortage is a serious problem in many areas, especially in large cities, economically advanced zones and coastal areas. It restrains economic development and particularly affects Beijing residents.

The Beijing municipal government and the Huaneng corporation decided to jointly build the thermal power plant to both ease the load on electricity and improve the environment.

It will be equipped with advanced technology and equipment from abroad to avoid pollution.

The plant is expected to be ready in 1997, when it will supply 4 billion kilowatt hours of electricity a year to the capital as well as providing heat to 20 million square metres of buildings and producing 5 million tons of steam an hour for industry.

Since its establishment in 1985, the Huaneng corporation has used foreign funds to build 10 thermal power plants with a total generating capacity of 5.8 million kilowatts.

**Quicker Pace Urged for Three Gorges**  
40101014B Beijing CHINA DAILY in English  
14 May 93 p 1

[Text] The government is set to speed up the Yangtze River Three Gorges project, which is expected to be launched before the end of this year, according to a national conference examining the project's construction programme.

Vice-Premier Zou Jiahua, who leads the State Council's Three Gorges Project Office, told the conference that construction of the massive project, whose preliminary design is now being appraised, should be accelerated so it can benefit the nation's economy sooner.

On its opening day yesterday, the conference approved the blueprint for a 1,400-metre long bridge spanning the Yangtze River 4.5 kilometres downstream from the dam.

The 18-metre-wide bridge, construction of which will begin this year, is considered vital for the construction of infrastructure and in resettling local residents, officials said.

Construction of the bridge is expected to take 32 months, according to the plans.

In a related development, the Three Gorges Securities Co., which will raise money for the dam's construction, has been launched in Yichang City in Central China's Hubei Province, near the site of the dam.

The company, founded with the approval of the People's Bank of China, is another preliminary step in the project. Residents in the Three Gorges area are now being relocated and some infrastructure is being built.

General Manager Wang Xunpei said Three Gorges Securities will raise funds by issuing stocks and bonds. The securities eventually will be listed on the stock exchanges in Shenzhen and Shanghai, Wang said.

It is estimated that the Three Gorges Dam will cost more than 57.1 billion yuan (\$10 billion), based on 1991 prices.

The company's registered capital will be between 150 million yuan (\$25.8 million) and 300 million yuan (\$51.7 million). The first-phase invitation of share capital is already under way, Wang said.

The Three Gorges Dam will be 1,983 metres long and 165 metres high and will be built at Sandouping, about 38 kilometres downstream from Yichang in Hubei Province.

According to a feasibility study, construction will take 18 years.

When completed, its hydroelectric plant, with a generating capacity of 17,680 megawatts, will be one of the world's largest and will significantly augment the country's energy supply. (CD—Xinhua)

**Sino-U.S. Joint Venture for Waste Water Treatment**

40101014C Beijing CHINA DAILY (National)  
in English 17 May 93 p 3

[Text] Chinese and US experts have joined hands to protect China's environment, which is facing threats particularly in urban areas as a result of growing industrial pollution.

A contract was signed yesterday by a newly-established Sino-US joint venture on a huge project for treatment of waste water from a 450,000-ton ethylene plant attached to the Beijing Yanshan Petrochemical Corporation, one of the largest petrochemical complexes in China. Approved by the State Council, the project costs more than 60 million yuan (\$11 million) and can purify 2,500 cubic metres of waste water per hour. The joint venture, named Huaxing Environment Engineering Company Limited, is the first of its kind in China and is aimed at pushing the nation's environmental protection to advanced levels. (CD News)

## MALAYSIA

### Minister Questions EC, U.S. Over Proposed Energy Tax

*BK1904080893 Kuala Lumpur BERNAMA in English 0323 GMT 19 Apr 93*

[Text] Kuala Lumpur, April 19 (OANA—BERNAMA)—Minister in the Prime Minister's Department Syed Hamid Albar said the energy tax on petroleum proposed by the European Community and the United States may not be for the protection of the environment but for the coffers of developed nations.

He said the petroleum-producing countries, including Malaysia were worried about the developed countries' proposal to introduce the tax because it discriminated against petroleum.

If these countries wanted to protect the environment, they should not focus on petroleum because there were

other fuels like coal which was one of big contributors to pollution, he told reporters here Sunday.

Syed Hamid said the tax would be detrimental to the interests of oil-producing countries as the production costs would rise and the returns of countries using oil for development would be affected.

Syed Hamid also questioned why the tax did not involve coal for which the EC had given many subsidies instead.

The countries concerned should conduct comprehensive tests on energy to determine whether carbon dioxide was the main cause of pollution, he said, adding that the producing countries wanted fair treatment.

According to earlier press reports, the EC countries will impose an energy tax of U.S. \$3 a barrel on crude import this year. Under the proposal, the tax will increase by U.S. \$1 a year until it reaches U.S. \$10 a barrel by the year 2000.

The United States has also proposed a similar tax.

## CHILE

### Committee Forms Against Puyehue Dam Project

93WN0380C Santiago *EL MERCURIO* in Spanish  
1 Apr 93 p A1, A10

[Article by Nieves Aravena]

[Text] The Pilmaiquen Company is seeking approval to build a metal dam at the mouth of Pilmaiquen Lake. On this dam depends the construction of a future complex of four small power plants, with a total power of 100 megawatts.

A new dispute about natural resources is heating up here in southern Chile. And once again the opponents are ecotourism vs. a hydroelectric company.

This time the star of the controversy is Lake Puyehue. This body of water, 40 kilometers from this city, is fed by the mighty Gol-Gol River, which originates in Puyehue National Park, and flows into the Pilmaiquen River. It is one of the greatest tourist attractions in the Tenth Region.

Some of its beaches, formed of rubble and sands of volcanic origin, might be left under water. They are "national property for public use," and the company is seeking permission to flood them, say opponents of this initiative.

Pilmaiquen S.A., the owner of the plant of this name, has requested authorization from the Department of Marine Resources to build a dam that would raise the water from its current level of 103.5 meters to 105.25 meters.

Since 1956 there has been a wooden dam at the lake's outlet that regulates the flow of water reaching the 39-megawatt plant, located six kilometers downstream from the outlet river. "With a new dam at a level of 105.25 meters, we could store a larger amount of water in Lake Puyehue, using the spring melt to generate electricity between January and April, when there is little rainfall, and there are water shortages," say Pilmaiquen executives Oscar Valenzuela and Andres Orellana, general manager and operations manager, respectively.

They say there are clear benefits: "This is a good deal for the company to store water and also for the country, as it is less polluting than generating electricity with oil and coal."

#### Defense Committee

On the opposing side, representatives of the Committee to Defend Lake Puyehue, formed by well-known persons in the area, are calling for the community to reject the dam.

They believe that what the company wants "is a real ecological assault, which would mean the end of tourism here."

This committee is formed of representatives of the Ecology Institute of Chile, hotel groups, production and commercial sectors, and the provincial office of Sernatur [National Tourism Service].

They have made public 9,812 signatures collected in Osorno and Puyehue, as evidence of the strong opposition to the Pilmaiquen hydroelectric project.

"They have to demonstrate to us that there will be no ecological damage before the level is raised one centimeter above 103.5 meters. This lake is national property for public use. It belongs to all the Chilean people, and this company wants to use it for its own private business," says the committee chair, attorney Waldemar Monsalve.

In his view, the damage would come from flooding the beaches, which would alter the ecological balance on the shores, affecting flora and fauna, and from flooding the farmlands of small landowners.

Monsalve, who also heads the Ecology Institute, explains that the Puyehue is like a "wider river" that starts in the Gol-Gol up in the Andes, and that any attempt to "dam it" will affect conditions in the lower part of this water course, which lies in a national park.

#### Project Halted

This reaction has put a hold on the Pilmaiquen projects. They say that the delay in processing the permit application by the Department of Marine Resources is unusual. That disturbs them.

The real reason is that the construction of a new metal dam with floodgates, at a cost of \$1 million, would not only supply the present plant, which barely produces about three percent of the interconnected power system. It is also "a basic factor" for the future construction of a complex of four small plants down on the Pilmaiquen River. They are: Rucatayo and Trafun, each with a 30-megawatt capacity, and Maihue and El Avellano, 20 megawatts each. In all, these units would require investments of \$120 million.

"If they oppose this, I do not know what they are going to allow. The country needs small viable projects that will create less of an adverse environmental impact," says Orellana, adding that many people are using their influence to keep this project from becoming a reality, including parliamentarians representing the area.

"Here we are talking about raising the water level by 1.5 meters, to a level that the lake has reached at other times, and keeping it stable over a longer time period," he added.

Although no environmental impact study was done, as their advisers consider it unnecessary, the Pilmaiquen executives say the water will invade coastal areas set aside "for public use and not private lands."

They even say that contrary to what the detractors think, tourism will benefit, as in some campgrounds no more than 10 meters of beach will be lost, and in others, "people will be able to go directly from the meadows to the water."

#### End of Tourism?

For businessman Carlos Schott, another member of the committee, it is essential to require an environmental impact study to protect tourism and the lake's environmental future.

"The loss of beaches will put an end to tourism at Puyehue, as tourism is very sensitive to environmental changes. Nobody will want to come if, instead of sand, there is a quagmire or a proliferation of reeds and rushes along the shore," he said.

The provincial director of Sernatur, Lidia Morales, said that in March 1991 she presented their disapproval to the Department of Marine Resources, which had asked the organization to comment. A new request for reconsideration, made in January 1992, also received a negative response. She added that recently the national director of Sernatur, Eugenio Yunis, who favors a tourism master plan for the lakes, made a similar statement to the marine resources authorities.

#### To whom do the beaches belong?

The managers of Pilmaiquen say that "in building the dam, what we want to occupy (by flooding) is national property for public use, the beach, which would not affect private property."

They add that the Department of Marine Resources has not clearly defined the "shoreline" for lakes, as it has for the seacoast. And as this is "property for public use," both the Ministry of National Resources and the marine authorities have now been involved by a Senate motion supported by Senators Bruno Siebert (RN [National Renovation]) and Gabriel Valdes (DC [Christian Democracy]).

The Committee to defend Lake Puyehue, meanwhile, emphatically asserts that "these beaches belong to 13 million Chileans."

So it seems that this dispute will be extensive in scope, following the course of the hydroelectric dam that might be located a little to the north, on the powerful Biobio River.

#### Pellet Plant Official Defends Environmental Record

93WN0380A Santiago *EL MERCURIO* in Spanish  
3 Apr 93 p C14

[Text] The general manager of CMP [Pacific Mining Company], Rolf Sommer, said the Supreme Court ruling against the Huasco Pellet Plant does not cover ecological and agricultural destruction of the area, but only orders

the CMP to comply strictly with Decree No. 4 of the Ministry of Agriculture, published in May 1992, which sets emission standards for megasources of emissions.

"This means that the ruling required the CMP to comply with a standard that was not in effect and did not even exist at the date when the olive growers filed their suit (in 1986)," he indicated.

In a press conference, he stated his company's position on the suit filed by Huasco Valley olive growers seeking compensation for damages. Based on a Supreme Court ruling, this suit argues that the pellet plant's activity allegedly damaged the area's olive production.

Sommers reported that investments of about \$10 million have been made in the pellet plant to comply with environmental regulations. He denied that the environmental damage was so great that it could have put an end to olive production.

He said it can be proved that "those trees, as well as pear and quince, other fruit trees, and vegetables are now laden with fruits."

The compensation sought by over 200 olive growers comes to more than \$62 million (25 billion pesos). The case is being handled by attorney Fernando Dougnac, who said that the suit is based on a Supreme Court ruling issued in August 1992, "concerning the agricultural and ecological destruction the pellet plant has caused in the Huasco Valley over a 15-year period."

The attorney indicated that just in October 1990 the plant released 40 tons of particulates a day, and dumped into the sea about 172 tons of wastes per hour, damaging Chapaco Bay.

The executive in charge of the plant's environmental program, Erich Wiber, said that polluting emissions from the plant are now within normal limits. He also announced that they plan to build an underwater collector to remove wastes deposited in Chapaco Bay.

#### Investments

The CMP's general manager said his company has fully met its environmental responsibilities. Of the investment of \$370 million made when the pellet plant was built in 1978, he said approximately \$22 million was spent on the most modern equipment available at that time, so that the plant's operation would not harm the environment.

In addition, since the plant began to operate up until the present, investments of close to \$10 million have been made for the same purpose.

In 1992, after the Supreme Court ruling and a resolution of the Agricultural and Livestock Service, he said that the CMP installed the nation's first environmental monitoring network, in order to determine precisely the level of pollution its production process might cause.

He also said that numerous studies and analyses have been conducted by foreign firms specializing in this issue.

He noted that air quality standards for particulate matter in the Huasco River area were set in May 1992 by Decree No. 4 of the Ministry of Agriculture, "which could only be issued on the basis of a study conducted by the INIA [National Institute for Agricultural-Livestock Research], which was arranged by CMP, in agreement with the olive growers and local officials."

He said the Pacific Mining Company is the major economic activity in Huasco Province, and its business affects the lives of 3,000 workers and their families, as well as local business and cultural activities.

#### Deputies Amend Native Forests Bill

93WN0380B Santiago *EL MERCURIO* in Spanish  
3 Apr 93 p C7

[Text] Valparaiso—The Joint Committees on Agriculture and Natural Resources of the Chamber of Deputies have completed work on the bill on the rehabilitation of native forests and forestry development, after introducing some important amendments in the original text drafted by the executive.

One modification was the deletion of the provision stipulating that the bonus awarded to management plans for native forests would be determined by a selection process.

Under that option, approved plans were to enter a selection process, so some would not receive this benefit. The members of the joint committees considered that a negative feature, as the bonus offers not only an economic benefit, but a social benefit as well.

Deputy Antonio Horvath, a member of these committees, said that with the deletion of this provision, all native forest management plans that qualify have the right to the bonus, so the benefit will no longer be subject to a selection process; upon the approval of the plan proposed for native forests management and development, the plan will be entitled to this bonus.

He added that the bonus covers 75 percent of the net costs for plans that qualify normally and 85 percent for small forest owners.

He also cited as important the creation of a special fund for research and promotion of forest activity, intended primarily for small and midsized industries. It is designed to provide improved training and also better soil preparation for planting native woods.

As this is a parliamentary measure, this fund is to be created with 50 percent of the fines paid for violations of forestry laws, in addition to an amount that may be allocated from the national budget each year.

Another measure intended to improve the Forestry Advisory Council was supported by the joint committees. This council deals with ecological matters and highly productive forests. One more council member has been added, who is to be an agronomical engineer.

One government measure was maintained, but approved only with the votes of the coalition. It states that the determination of forest supervisors, which may be private entities, will be subject to veto by CONAF [National Forestry Corporation].

The forest supervisor's task is to supervise and authorize management plans for native woods and to oversee forestry activity. This activity has been limited, and is now a sort of appendix to CONAF.

Deputy Horvath said that this government measure, which was approved by the coalition, will be revised on the floor, as sectors involved in forestry activity are concerned that it may be considered a "withdrawal of confidence from the private sector."

He said: "We believe the private sector is capable of taking on the work of advising, study, and oversight of our native woods. Clear operating rules and supervision mechanisms can be established so that supervisory roles will not be confused with production roles."

The parliamentarian said the bill is now ready to go to the floor to be debated and voted on by the chamber at large. They believe the native forests law will be enacted by the middle of 1993.

## GUATEMALA

#### Desertification Threatens Economy, Nation

93WN0383A Guatemala City *SIGLO VEINTIUNO*  
in Spanish 16 Mar 93 p 16

[Article by Tulio Juarez]

[Text] The figures cited in the following article are taken from the National Report on the Environmental Situation of the Republic of Guatemala that was presented last year at the UNCED [expansion not given] World Conference on the Environment and Development. The event was held in Rio de Janeiro, Brazil, with the participation of most of the governments of America. The Guatemalan document is but the beginning of a continuous process of talks, and an invitation to all to participate.

With respect to natural renewable resources and their future development, a complete picture can be obtained starting from their quantitative and qualitative characteristics and from current methods used for their management.

The experts agree that only in this way can we achieve a rough overall view of the reality, especially since Guatemala's environmental problem does not present isolated aspects, hence none whose negative impacts are isolated.

They point out that it is possible to identify those natural resources that have the highest priority as determinative factors in the socioeconomic and political life of the nation, and whose loss, or degree of irreversibility of deterioration, will put the lives of future generations in great danger.

### Accelerated Deterioration

According to the United Nations Food Fund and UNESCO, Guatemala's soil consists of 13 different types. Of these, 70 percent are suitable for the cultivation of forest products, and 26 percent for the intensive cultivation of farm products.

The most fertile soil is used, for the most part, for the growing of cash crops and livestock. Of the country's 606,376 farms, 73.96 percent are owner-operated and cover 84.54 percent of the national territory.

Medium-sized multifamily-owned farms account for 2.02 percent of the total, and cover 40.8 percent of the national territory, while 0.07 percent are large multifamily-owned farms covering 19.95 percent of the territory. This means that 2.09 percent of the total number of farms cover 60.75 percent of the national territory.

The General Secretariat of Economic Planning has calculated a density of 0.79 inhabitants per hectare of cultivable land, without considering the qualitative differences that occur in the land, and the concentration in terms of tenancy.

At the same time, the crops for domestic consumption, such as corn and beans, are produced on the high table land, where the population density is greater, and where the deterioration of fertility, resulting from the slash-and-burn land-clearing technique, is on the rise.

To the above must be added the contamination resulting from the use of agrochemicals, which, though they increase productivity, also contribute to the mentioned deterioration. Loss of the land's vegetal covering results in loss of all possibility of cultivating forest products.

The catchment of water also diminishes, the soil temperature rises, and components of the ecosystem and biodiversity are destroyed. This is the opinion of the experts who indicate that it affects the quality of life of human beings on this planet.

### Principal Causes of Erosion

The principal causes of erosion are: deforestation; inadequate seasonal farming techniques on hillsides and steep slopes; lack of suitable farming techniques in general; vulnerability of the soil to erosion; and land management plans that do not utilize the land in accordance with its characteristic potentials.

Surveys have shown that approximately 63 percent of Guatemala's soil undergoes erosion in various degrees,

and that, in general, the loss of soils in areas with dense vegetal cover ranges between 200 and 300 metric tons per hectare per year.

Meanwhile, in areas that are already deforested, these figures rise to between 700 and 1,100 metric tons per hectare per year. This gives some idea of the grave results of depredation of the nation's "green wealth," and of the risk the nation is running of becoming a desert at a pace that is measurable in giant strides.

### Chixoy in Danger

The National Report on the Environmental Situation reveals that the Chixoy River watershed, where the country's largest hydroelectric plant generates 65 percent of its electric power, has begun a course of accelerated deterioration and degradation.

The researchers have estimated the erosion rate at 800 metric tons of soil per hectare per year. This settles into the reservoir of the complex. To this is added the marked rate of deterioration, degradation, and contamination of the Pacific coast resulting from the use of chemical fertilizers and pesticides.

"Mismanagement of the land resource is depleting it of humus, which is its most fertile component. Furthermore, the resulting transport to and deposition of the soil in the watersheds of the rivers that flow into the bodies of still waters is accelerating the eutrophication of these waters," they say.

They emphasize that insecticides, herbicides, fungicides, etc., if improperly used, indiscriminately destroy the vegetal and animal species. Agrochemicals are therefore lethal to the ecology.

They cite cotton, as an example, which in 1972 had an area "insecticide load rate" of 48.6 kg per square kilometer, and in 1975 attained a rate of 123.7 kg per square kilometer, to illustrate the unprecedented increase in the mentioned deterioration, degradation, and contamination.

### Maximum Priority

The National Report stresses the importance of Guatemala's soil to the nation from the standpoint of earning foreign exchange as well as supplying the needs of its domestic market—in that Guatemala bases its economy on agriculture—and accords maximum priority to it.

Nevertheless, the deterioration of our soil continues, representing a grave social and economic risk in the short term, because it directly undermines Guatemala's primary resource for the subsistence of the millions of Guatemalans.

**Deforestation of Mayan Biosphere Continues  
Unabated**

*93WN0383B Guatemala City SIGLO VEINTIUNO  
in Spanish 21 Mar 93 p 3*

[Text] Although the struggle being waged by the environmentalist organizations and official institutions seems sterile, many of their members are continuing to work because they are natives of Peten and want to avert the destruction of the Mayan Biosphere. Were it not for this reason, as they put it, they would not continue risking their lives.

The return road to Santa Elena compels one to transit El Naranjo, a small village located 190 kilometers from Santa Elena, and separated from the Biosphere by the San Pedro River.

Plunderers live there who, last December, attacked reporter Omar Cano, Treasury agents, and representatives of CONAP [National Public Relations Council]. But notwithstanding the existence of capture orders issued on that occasion, those persons are still at liberty, while the police do nothing to apprehend them.

This problem, which compelled Cano to go into exile in February, worries CONAP's workers, because, they say, they are afraid the perpetrators will take action against them without receiving the punishment they deserve.

There are many reports linking Peten's timber dealers with the plundering of precious woods in the projected areas, but action by the judiciary is so slow that it actually helps the cutters to remove the logs.

According to CONAP's records, more than 20 truck-loads of lumber from the Mayan Biosphere leave daily for the capital. They travel more than 500 kilometers to their destination without being intercepted at any checkpoint, where it is easy to verify that they lack the required invoices and permits.

Each of those trucks carries an average of 20,000 quetzales of lumber, and there are cutters who have more than three of these vehicles operating on the same day, hauling away 60,000 quetzales a day in the clandestine trafficking of the nation's forestry resources.

The capture of the cutters also presents a problem. Some of the Treasury agents assert that they are risking their lives "for the fun of it," since all they succeed in doing is "carrying grist to the judges," because as soon as the plunderers pay the fine imposed on them, they are free to return and "continue doing business."

As the impunity continues, some of the members of these institutions hope that some day "these cutters will be put in jail." One of them says, "Sometimes I would like to be a judge for just one week, so as to do away with these people."

CONAP's representatives assert that the problem is getting worse, with the depredation reaching extreme

levels in the Biosphere and continuing toward north-eastern Peten, where large forests of mahogany and cedar still exist.

The latest area of the Mayan Biosphere being laid waste was discovered in December of last year in Paso Caballos, near El Naranjo. The deforestation is now approaching a point some 20 kilometers from the Mexican border, an area that is difficult to patrol because of its distance from Santa Elena and because it is a very densely forested region.

At the rate at which the plundering is progressing, CONAP's experts say that "in just a few years there will be no more forests of precious woods, and the world of green mystery will have been turned into one of black reality."

According to one of the pilots of the small planes operating in Santa Elena, the Santa Amelia landing strip was built in 1970 by the oil companies that were operating in the area. It was subsequently not used for years. But although it is assumed to have been abandoned, it shows signs of ongoing maintenance.

It appears to be considered dangerous, since the airlines operating in Santa Elena declined to fly to the area. Their agents indicated that the Army has recommended that the strip not be used because it is deemed not to offer much security.

The CONAP workers also requested military helicopters to reach the zone, but these were refused, as was protection in the area to back up the light aircraft.

Residents of Santa Elena assert that "Santa Amelia is full of guerrillas who use that landing strip, making it dangerous for the airline pilots and for the aircraft." The guides, however, say that the region is swampy and characterized by low-level forests, hence not suitable for insurgent columns.

What the guides do say is that, two weeks ago, they saw an unidentified plane on that strip, without regional registry markings, seemingly indicating that the landing strip is being used by drug traffickers as a stopover point for the transporting of drugs.

CONAP representatives confirmed these statements by the guides, to the effect that the landing strips built by the oil companies more than 20 years ago are being used by the drug traffickers to conduct their business, and are therefore receiving ongoing maintenance.

In addition to the Santa Amelia strip, the unmarked planes are using the Paso Caballos and Dos Lagunas strips, located in the Mayan Biosphere near the Mexican border.

The nearest military detachment is located in El Naranjo, where, last December, the plunderers attacked reporter Oscar Cano, CONAP's workers, and the Treasury agents.

## ALGERIA

## Study on Levels of Pollution, Health Risks

93WN0411Z Algiers ALGER REPUBLICAIN  
in French 30 Mar 93 p 6

[Article by Kamel Eddine Kahli: "Annaba: Atmospheric Pollution Level; Population at Risk"—first two paragraphs are ALGER REPUBLICAIN introduction]

[Text] The last cloud of ammonia released directly by the stacks of the Asmidal complex—and for which no one has claimed responsibility yet—nearly marked for life 13 high-school students of Safsaf. Almost asphyxiated, they were saved only by the immediate intervention of the emergency medical service.

The "monster" or "time bomb," as many citizens insist on calling it—as a warning—has struck hard again.

The number of such accidents or incidents has continued to increase since the complex was built right next to highly populated areas.

Denounced by the town's entire scientific community, the ogre goes on with its work of destruction and poisoning. Neither its management, nor the local authorities, nor the successive governments have had the courage to close it or move it elsewhere. National economy and the future of hundreds of workers' families seem to take precedence over the health of hundreds of thousands of citizens, over the ecological balance of a town that is losing its fauna and flora every day.

Protest marches by residents of El-Bouni, red alerts from the APEP [expansion not given], scientific seminars organized by Messrs. Senadi and de Belaid, remained unanswered.

Unanswered also were the bitter conclusions of some 100 papers and theses written by advanced-degree candidates and ecological and environmental engineers who, lacking jobs and the good will of those in charge of protecting the environment, are left unemployed or retrained as teachers.

Zineb and K. Farida were the first two students to undertake a serious epidemiological study of their town's pollution by the sulfur dioxide ( $SO_2$ ) coming out of the Asmidal stacks. Zineb ended up relying on her own resources to continue her studies overseas; Farida has been unemployed since 1989. Yet, their research deserves to be continued, if only because the subject is of interest and the first results already available.

## By Way of Introduction

Over a period from 1930 to 1957, London, Denora, Costa Rica, Los Angeles, the Meuse valley, and many other highly industrialized towns have taken turns as capitals of grief and ecological disasters.

Tens of deaths, a few thousands of people who felt ill, and a series of epidemics that made the headlines and enriched the annals of pharmacy.

The archives of world organizations and regional agencies specializing in pollution control and environmental and human health protection are full of figures and examples resulting from various studies made to determine and identify the part played by  $SO_2$  in pollution.

The WHO does not conceal its helplessness, stating that 600 million city dwellers are suffering from excessive  $SO_2$  levels. The OECD has shown that in Athens, in 1980, when  $SO_2$  levels tripled, the number of people hospitalized for respiratory and cardiovascular diseases doubled. An increasing number of physicians ascribe 5 percent of all asthma cases to  $SO_2$  pollution.

## Ignorance That Wounds and Then Kills...

At a recent seminar organized by the local Health and Welfare Department, Farida was amazed to read in an APS release a statement made by some participants, regretting the lack of surveys and research on the impact of atmospheric pollution on the health of Annaba inhabitants. Omission or pure ignorance?

It does not matter.... Farida is preserving her figures carefully although, occasionally, she finds that some distinguished brain or magazines of a certain type will mention them without quoting their source. A source dried up by unemployment.

## Filtered Truths

Setting out to evaluate the level of atmospheric  $SO_2$  pollution in the haunted regions of Annaba, and the impact of that pollution on the health of its inhabitants, the two women determined—based on a first interpretation of the results obtained—that maximum, average, and minimum  $SO_2$  concentrations in a place like Boukhadra exceed 11, 7, and 5 times, respectively, the maximum permissible concentration set by the WHO.

Even for a limited time, and taking into account the toxicological importance and specific characteristics of the biological impact of  $SO_2$  (a gas that is typically an irritant of the upper respiratory tract and mucous membranes), the maximum values recorded still represent a considerable health hazard for the population.

An analysis of the overall morbidity by nosological group among the inhabitants of El-Bouni, Sidi Salem, and El Kala, showed that acute infections of the upper respiratory tracts are most prevalent and rank first in the morbidity structure for all age groups; they are followed by diseases of the lower respiratory tract, asthenia, and finally dermal and ophthalmic affections.

The prevalence rate of lower respiratory tract diseases occurring in El-Bouni and Sidi Salem are relatively important and testify to the effect and impact of  $SO_2$  pollution on people's lungs. Exposure to atmospheric pollution eventually results in nonspecific effects that

translate into a general weakness of the organism, a lowering of its resistance, and therefore a greater chance of suffering from various diseases and infections, which in turn lead to general fatigue and eventually asthenia.

Relative risk figures show that in El-Bouni and Sidi Salem the risk of diseases of the upper respiratory tract is highest for the 4-15 age group (index value of 21 at El-Bouni and 17.5 at Sidi Salem). The relative risk coefficient for the 0-3 and 16-40 age groups is significant.

A significant relative risk was also found to exist for dermal and ophthalmic affections.

(11.25 at El-Bouni, 5.5 at Sidi Salem) while for diseases of the upper respiratory tract it was found that the relative risk for the 0-3 and 16-40 age groups was equally significant (4.5 and 5 at El-Bouni and 2.5 at Sidi Salem). [sentence as published]

A study of morbidity among these populations exposed to fumes from the Asmidal complex and other industrial centers, concluded that:

- respiratory tract diseases are most prevalent, due to the presence of pollutants that directly affect the respiratory tract;
- the breakdown of pathological cases by sexes shows that, for all types of diseases, the morbidity rate is not affected by the sex of the patient;
- the breakdown by age group shows that pollution affects individuals according to their age (intense morbidity in the 4 to 15 age group for upper respiratory tract diseases, and in the 0-3 age group for lower respiratory tract diseases) and their sensitivity.

Pollution was found to be considerable in all residential areas studied, which leads to the conclusion that the population is exposed to consistent pollution, except at Boukhadra and El-Bouni, where concentrations are far greater. Even in areas where concentrations were lowest, a definite health hazard exists because these lowest levels markedly exceed accepted standards.

#### 'I Feel Useless'

After knocking in vain at so many doors, the mother of Seif and Houssein yielded to despair. Her letters to agencies and departments responsible for environmental protection and conservation would be twice as heavy as the silence observed by officials in these departments. "I feel useless," she grieved, and put away her engineer's paper under her pillow. A second paper, an advanced-degree thesis on "the impact of fluorinated pollution on pear trees and pear trees [sic] at the Gharbi Aissa farm" lies there too, kept warm in a bed where four people sleep. No comment; we hurried to write this appeal to prevent our cadre and our hopes from being marginalized.

#### Boussaada: Growing Pollution Concerns

93WN0411B Algiers *EL WATAN* in French  
14 Apr 93 p 24

[Article by special correspondent Ratiba Benbouzid: "Boussaada: An 'Ecological Bomb' in Prospect"—first paragraph is *EL WATAN* introduction]

[Text] Although the town of Boussaada has been until now one of the most highly prized Algerian oases and a favorite of tourists, nevertheless the deterioration of its environment increasingly contributes to the town's decay.

Located 245 km southeast of Algiers, the "oasis of happiness," as its inhabitants like to call it, long enjoyed the admiration of Algerian and foreign writers. Maupassant, to name just one, long praised this town and even became intoxicated with the Hodna sun, this "fire eating up a world" as he called it.

Its traditional architecture, which underlines the town's antiquity, also charmed many painters, the most famous and best known of whom was none other than Etienne Dinet. In fact, the colors of the oasis, its light and its traditions enabled the artist to complete 139 paintings. How much is there left today of so much atmosphere? Does the famous "Ferrero Mill" still attract as many nature lovers? What about the wadi and its famous palm plantation?

Unfortunately, the picture that the town presents today is not very pretty. Most gardens, palm trees, and cultivated areas that were the Boussaadis' pride and joy have disappeared, replaced by unrestrained, even anarchic constructions. This is to be deplored, all the more so when one considers that in the last century the cultivated acreage (palm trees) was twice as large as the built-up acreage. The people then made a living as farmers rather than as craftsmen or merchants.

Certainly, much can be blamed on the population explosion and the drift away from the land, but this does not explain at all the silence of local authorities. A member of the Association for the Protection of the Environment in the Boussaada Region stated: "All post-1962 buildings ignored the areas set aside by the Cadat [Territorial Development Fund] at the time. Located between two mountain slopes, the town is stifling; built-up areas are gradually taking over. The Association militates, among other things, to ensure that some green areas are preserved in the town. We are also fighting in court with private builders, to try and mitigate the damages."

"Djenane Belguizaoui," located just outside the town, would certainly have disappeared if the association had not intervened. In fact, a petition with over 1,000 signatures was submitted to the local authorities, and the municipality was given 180 million [dinars] to build a fence around the garden. When they decided to build on its 50 hectares [ha] of arable land, these private builders seem to have forgotten that "Djenane Belguizaoui" was

selected in 1978 to be the seat of one of the country's first zoological parks, and that this park is now anchoring the dunes with its eucalyptuses.

As for the palm plantation, it remains the only large green area; it is viewed as the town's lungs.

Pollution of the wadi also represents a major problem for the oasis population. Located upstream from the town, at an altitude of 1,500 meters, it is supposed to provide water for the palm plantation and the town's gardens. However, after the construction of the "Sidi-Slimane" district in the north and the creation of a waste-water pond that runs into the wadi, the latter has become a hazard for consumers. Actually, it still irrigates the palm plantation and the gardens over more than 10 km.

Farmers also use it to wash their vegetable crops and children just go and bathe in it in summer, without worrying about the risks of infectious diseases. Apparently users take no notice of the "Polluted Water" signs, although they are quite obvious. Others even use the wadi to drain and wash their vehicles, and truck drivers just break the pipes along the road to get rid of their waste products.

If the population's lack of concern and the authorities' casualness continue, the region might witness the explosion of a veritable "ecological bomb."

There is worse: all along the wadi, on the scenic El Allig Road, tourists suddenly get a view of a garbage dump, upstream from Boussaada. It covers 2 ha (of permeable land) and not only is it not enclosed, but it is also uncontrolled. Household waste as well as hospital waste (which is supposed to be incinerated) and nonbiodegradable products (plastic, glass bottles) are thus strewn on the ground.

In an attempt to solve the problem, the association made an appeal (a petition with 3,000 signatures was handed over to the local authorities) to create a controlled and regulated garbage dump. We should say that the signed petition concerning the wadi led to the allocation of 500 million [dinars] that made it possible to build a few pipes, but only partial ones.

The healthy effort required has not been made yet; the association's work alone will never suffice: it also made an appeal to similar associations to pool their efforts to protect the environment. Enjoying a central position in the M'Sila governorate, Boussaada certainly deserves that its case should receive due consideration.

## REGIONAL AFFAIRS

### Genetic Impact of Chernobyl Considered

93WN0413A Moscow NEZAVISIMAYA GAZETA  
in Russian 27 Apr 93 pp 1, 6

[Unattributed article under the "Expert Opinion" rubric: "The Genetic Cost of Chernobyl: Minus 10,000 Years of Living for Each Million in Population"]

[Text] The Chernobyl Commission was created some time ago under the USSR Supreme Soviet. Over its year of operation, it managed to gather a tremendous amount of factual material on 100 rayons affected by the Chernobyl tragedy. More than 200 experts took part in this work, and they decided to take what had been started to its logical conclusion.

Four volumes of conclusions reached by specialists are being readied for publication. One of the volumes—*Consequences of the Chernobyl Catastrophe for Belarus*—has already appeared in print. The second volume will be dedicated to the medical and genetic consequences of Chernobyl. We publish here a summary of a portion of this volume, which examines genetic consequences of the accident at the Chernobyl Nuclear Power Plant (expert review coordinator—Professor Vladimir Shevchenko).

One important particular feature of this project must be mentioned. Unable to find support either in the Russian parliament or in the Russian Federation State Committee on Chernobyl, initiators of the publication adopted the proposal of the International Association for Restoration of the Dwelling Environment and Safe Habitation for Man—a nongovernmental organization, which assumed responsibility for all the expenses incurred in financing this publication.

Methodological approaches to providing an assessment of the human radiation risk which have been developed by experts of the United Nations Scientific Committee on the Effects of Atomic Radiation [UNSCEAR] enable us to evaluate the expected genetic damage from ionizing radiation when the dosage absorbed by irradiated individuals is known. When the calculations of expected damage from the influence of radiation include multiple-factor inherited abnormalities manifesting themselves in an individual during the course of his entire lifetime, the genetic risk constitutes 50-347 incidents, in addition to the natural mutation process, of inherited abnormalities per 1 million newborn infants when the parents were subject to ionizing radiation in a dosage of 10 milli-Sieverts [mSv]. From this evaluation one can calculate the genetic risk for any human population for which the collective dosage is known. For example, assessment of the genetic radiation risk to the inhabitants of Pripyat using the above methodology provides the quantity 6-40 inherited abnormalities identified during the entire course of an individual's life per 10,000 descendants of irradiated persons during the first generation (the

average dose received by Pripyat inhabitants was 110 mSv, according to cytogenetic analysis data).

Genetic damage related to manifestations of hereditary pathology may be expressed in years of inferior life, or in indices of reduced life duration. The assessment presented here of an expected genetic risk of 50-347 incidents of inherited abnormalities in the first generation per 1 million offspring, under a dosage of 10 mSv, leads to the following evaluation of genetic damage: 1,100-7,000 years of defective life and 1,300-10,000 years of reduced life duration.

On the whole, according to the assessment of UNSCEAR experts, the full collective effective equivalent dosage from the Chernobyl catastrophe for all affected countries amounts to 600,000 man-Sieverts. Forty percent of this amount, i.e., 240,000 man-Sv, is attributable to the former Soviet Union (UNSCEAR, 1988). In this regard, the full collective effective equivalent dosage formed through the decay of Cs-137 is 430,000 man-Sv, Cs-134—120,000 man-Sv, J-131—37,000 man-Sv, and short-lived radionuclides—20,000 man-Sv. People of childbearing age comprise 40 percent of the entire population; accordingly, 40 percent of the full collective dosage indicated above may have an influence on future generations. This amounts to 240,000 man-Sv for all countries and 96,000 man-Sv for the former Soviet Union. Proceeding from these quantities, we may assess the total genetic damage from the Chernobyl catastrophe. In the first generation, this comprised 408 incidents of inherited abnormalities for all affected countries when calculations were made based on the risk values adopted by UNSCEAR, and 163 such incidents for the Soviet Union.

If we proceed from the risk assessments taking into account multiple-factor inherited abnormalities, then expected genetic risk in the first generation will comprise 1,200-8,300 incidents for all affected countries, and 480-3,300 incidents for the states which were part of the former Soviet Union.

In this manner, relying on the criteria and methods of evaluating genetic consequences and the effects of ionizing radiation on the human population which have been developed by UNSCEAR, assessments in principle may be made of the possible genetic effects of the irradiation of people in the first generation and subsequent generations as well. Using various indices of genetic damage, we may provide the most general prediction of economic and social damage from man's inherited abnormalities caused by radiation. The prediction presented should be considered approximate, insofar as it does not take into account a number of important factors which can increase the expected danger of human irradiation. For example, unresolved questions of human genetics include evaluation of the influence on man's vital capacity of "minor" mutations which, in mutual interaction with other mutations, could have a significant influence on human health. A great

deal is unclear in the problem of inherited cancer illnesses. The genetic sensitivity of human sexual cells and early embryonic stages of development have received little study. Obviously, serious development of the appropriate fundamental research is required to resolve these and other issues of human radiation genetics.

In examining the genetic consequences of the Chernobyl catastrophe, we proceed from assumptions that all genetic effects related to single-exposure damage to genetic material (point mutations, splitting of chromosomes, etc.) show a linear dose-effect dependency (these hypotheses are supported by UNSCEAR experts). It must be kept in mind, however, that all calculations of risk of mutual interaction of small radiation doses based on the hypothesis of linear dependency may turn out to be underestimated, since more and more scientific publications are appearing today showing that in the sphere of small radiation doses under conditions of chronic irradiation of various objects—plants, animals, and man—a supralinear dose-effect dependence is observed. It follows from the supralinear dose-effect dependence that the relative effectiveness of irradiation at low dose intensities per unit of dose is higher than the effective irradiation at high dose intensities.

As long ago as 1964, at the Third International Conference of the United Nations on the Use of Atomic Energy for Peaceful Purposes, in a speech dedicated to the genetic effects of small doses of ionizing radiation, N.P. Dubinin and his co-authors showed, on the basis of experiments conducted on fruit flies, that for chronic influence of gamma radiation at low dose intensities, a greater number of point mutations (lethal recessive genes) are induced per 1 rad than for high dose intensities—greater by a factor of several times. The results obtained show “a significantly greater genetic danger of irradiation in small doses than should be expected proceeding from an extrapolation of the data obtained for irradiation in large doses.”

An extremely important stage in assessing the effectiveness of small doses of radiation was the discovery in 1971 by Canadian researcher E. Petkow of the high-level effectiveness of small radiation doses on artificial phospholipide membranes, for which he received the Nobel Prize in 1973. He showed that irradiation under low dose intensity (0.001 rad/minute, overall dose 0.7 rad) causes the same destructive effect in membranes as that occurring for irradiation in a dose of 3,500 rads at dose intensity of 26 rads/minute. In other words, irradiation at low intensity turns out to be 5,000 times more effective than irradiation at high intensity! This phenomenon, termed the “Petkow effect,” was reproduced

many times in the study of various stochastic radiobiological phenomena, including cancer.

The relatively greater effectiveness of small radiation dose intensities (by a factor of 10-100) was detected while studying the genetic consequences of the Kyshtym accident of 1957 to plants and animals (Shevchenko and others, 1978). Supralinear dose dependency was described as well with respect to the genetic effects observed in plant populations growing in the 30-kilometer zone of the Chernobyl accident.

In this manner, application of a linear concept in evaluating the genetic risk of irradiation of the population most likely leads to a significant underestimation of the scope of the genetic consequences of the Chernobyl catastrophe. Fundamental laws of nature discovered upon evaluating the relative effectiveness of the influence of small doses and low-intensity doses of radiation must lead to the application of supralinear dose dependencies in calculations of genetic and other hazards of irradiation—this represents the most humane approach, since it precludes the possibility of underestimating the risk.

It is necessary to note that until the present time, services responsible for radiation safety of the population have not devoted the required attention to matters concerning the genetic consequences of the effect of ionizing radiation on man. At the same time, UNSCEAR has developed a methodology for predicting the genetic risk of human irradiation, on the basis of which one may conclude that following the Chernobyl catastrophe, genetic consequences entirely determinate in nature can be expected which lend themselves to quantitative assessment.

Analysis of materials on the state of health of the populace in regions affected by the Chernobyl catastrophe shows that for certain indices of genetic mutability (levels of chromosome aberration, congenital anomalies) in the most contaminated regions in 1987-1991, real excesses are seen over the levels observed in the period prior to the accident.

An assessment of the genetic consequences of the catastrophe at the Chernobyl Nuclear Power Plant must be based on broad-scale epidemiological surveys of the populace in regions affected by the accident and control regions. A genetic monitoring service is necessary in principle in our country, and not only in connection with the accident at the Chernobyl Nuclear Power Plant—there are many regions in the country where the ecological situation has reached an emergency level. In such regions, there is no more urgent or humane task than exercising concern for the genetic health of future generations.

## RUSSIA

### Arkhangelsk to Ration Drinking Water

93WN0398B Moscow NEZAVISIMAYA GAZETA  
in Russian 10 Apr 93 p 6

[Unattributed item: "Shortage of Drinking Water"]

[Text] Two hundred thousand cubic meters—that is the daily consumption of drinking water in Arkhangelsk. The city purification facilities, however, are capable of handling no more than 150,000 cubic meters of water per day. Taking into account that water from the Northern Dvina, polluted by waste from chemical plants and lumber mills, cannot be used without purification under any circumstances, Arkhangelsk Municipal Council decided to limit the supply of drinking water to residences. Water will be fed into the city water system only from seven to nine in the morning and for two hours in the evening. The supply of drinking water become problem number one for Arkhangelsk. This in the light of the fact that the Northern Dvina with regard to the size of its water basin occupies a third place in Europe and the population of Arkhangelsk is only 440,000.

### Tomsk-7: IAEA Finds Only One-Third of Tomsk Chemical Plant Plutonium

AU1904163893 Paris AFP in English 1259 GMT  
19 Apr 93

[Text] Vienna, April 19 (AFP)—International inspectors have found less than a third of the plutonium that was inside a nuclear weapons plant in Siberia before an explosion there two weeks ago, officials said Monday.

"We have not been able to determine yet whether any of the plutonium was released," said David Kyd, a spokesman for the International Atomic Energy Agency (IAEA).

"It is possible that the two thirds missing are somewhere inside the heavily damaged plant but we cannot exclude the possibility that some plutonium escaped," he added.

Of the 310 grams (11 ounces) at the plant before the April 6 blast, an IAEA team has located only 80 grams (three ounces), he said.

The three investigators, who visited the Tomsk site in Siberia between Thursday and Sunday of last week, gathered earth, snow and grass samples from the region. The items will be examined by IAEA labs near Vienna.

Kyd said any radioactivity from the blast should disappear within one to six months. The radioactive effect of the explosion amounted to 40 curie points, compared to the 1986 Chernobyl blast which recorded between 25 and 50 million curie points, he said.

He added that as a protective measure, about a hundred residents from a village neighboring the Tomsk plant have been evacuated for two months.

The blast occurred a chemical storage facility on the Tomsk site.

### Tomsk-7: Independent Experts on Tomsk-7 Accident Aftermath

LD2004173193 Moscow ITAR-TASS in English  
1321 GMT 20 Apr 93

[By ITAR-TASS correspondent Veronika Romanenkova]

[Text] Moscow April 20 TASS—Independent ecology experts, who examined the aftermath of the Tomsk-7 chemical plant accident, have agreed with the conclusions of the State Commission.

In their opinion, the situation in the Siberian chemical plant area does not require urgent interference, a news conference at the Russian Nature Conservation Ministry, which initiated the independent examination, was told here today.

At the same time, a program of further observations will specify the radio-ecological situation, thoroughly examine the availability of trans-Uranium radionuclides and estimate the degree of radioactive water pollution.

The blasted tank contained substances of medium activity - over eight tonnes of Uranium and 310 grams of Plutonium, which attracted special attention of specialists. The latter revealed indirect signs of the Plutonium presence in the explosion discharge.

According to trace Plutonium examination, the maximum density of its fall-out amounted to 0.008 curie per one square kilometer. Besides, the independent experts said the radioactive fall-out, which is identical in all measurement points, contains Ruthenium- 103 (the semi-decay period of 39.3 days), Ruthenium-105 (the semi-decay period of 368.2 days), Zirconium-95 (the semi-decay period of 64 days) and Niobium-95 (the semi-decay period of 35 days). They also suggested the availability of Americium-241 (the semi-decay period of 432.2 years).

In the opinion of independent specialists, the major part of radioactive substances remained in the so-called canyon and did not get into the environment. Nevertheless, the area of surface with the radioactive background level, exceeding 20 micro-roentgen per hour, amounts to approximately 250 square kilometers. The radioactive background level in the accident site is five-six roentgen per hour.

Independent experts and specialists from the Ministry of Nuclear Power Engineering do not compare the aftermath of the Chernobyl and Tomsk-7 accidents. However, today's news conference was told, under the Chernobyl indices, people, who receive over 0.5 BER (Biological Roentgen Equivalent) plus the natural background, are liable for obligatory re-settlement.

**Tomsk-7: 'Vesti' Queries Findings**

*LD2004183393 Moscow Russian Television Network  
in Russian 1000 GMT 20 Apr 93*

[Video report from Tomsk by correspondent A. Peslyak—from the "Vesti" newscast]

[Text] [Announcer] Today a special commission from Russia's Ministry of Environment and Natural Resources confirmed that, by both domestic and international standards, the situation in the area of the Siberian chemical combine at Tomsk-7 does not require any urgent intervention or evacuation of citizens.

[Peslyak] The investigation team from the Environment Ministry is regarded as independent, since it operated independently of the Ministry of Atomic Energy and the State Committee for Emergency Situations. It flew to Tomsk on 10 April. For the first two days after the explosion on 6 April, decisions on protection of the population and all statements were issued at oblast level, by qualified local personnel. According to the experts, most of the radioactive solution remained in the tank. The remaining contents, amounting to 40-45 percent of its total volume, were later pumped out. The 15-km radioactive cloud posed a certain degree of threat. It drifted northwards into the taiga, where it fell in the form of snow.

When "Vesti" asked why a tripartite group of representatives from our ministries, the International Atomic Energy Agency, and independent ecologists had not been set up right from the start, the answer was evasive, along the lines of an assurance that the scale of the incident had been realized right from the start. But why did they not tell anyone? Why did they not invite the press to fly in on the very first day, if everything was so harmless? [video shows meeting of officials and reporters]

**Former Nuclear Safety Inspector Interviewed**

*MK2104085293 Moscow SEGODNYA in Russian  
No. 9, 20 Apr 93 p 6 (Signed to Press 19 Apr)*

[Dmitriy Frolov article in "Profiles" column: "Civil Servant"]

[Text] Up until recently Vladimir Kuznetsov was a man known only within his own circle and had every chance of remaining that way. If he had not begun to stop nuclear reactors. He could not help but do that, since he was working at the State Committee for Nuclear Safety [Gosatomnadzor] Central District Department as chief of the inspectorate overseeing nuclear and radiation safety. From July until December 1992 he issued 10 injunctions banning the operation of reactors, including the most powerful ones in Moscow—the MR and IR-8 on the territory of the Kurchatov Institute scientific center. In all likelihood, it was their closure that became fatal for Vladimir Kuznetsov's career. He was summoned by Gosatomnadzor's leaders, who suggested that he resign "of his own free will." Otherwise they promised

to reopen the case of bribe taking in which he was allegedly involved. Kuznetsov maintains that he never accepted any bribes but nonetheless submitted his resignation. While unemployed, he is in no particular hurry to go to court. "I am simply afraid," he says. "They explained at the prosecutor's office that, if necessary, witnesses would always be found. One of the officers observed that he could not really understand why I had not yet been run over by a car."

[Frolov] This is really terrifying. When you were issuing orders to shut down the reactors, were you aware of the implications?

[Kuznetsov] I only knew that they were being operated in violation of the rules, and that posed a serious danger of accidents and a direct threat to human life—to the life of the entire city. Of course, the closure affected the institute, which was forced to stop many projects under contract, as well as the clients themselves, most of whom were military.

[Frolov] How was it possible to exert such tough pressure on Gosatomnadzor, which in theory is independent?

[Kuznetsov] If you are interested in the technical side of the matter, this was done quite simply—by telephone. As for the extent of its independence, it is plain to see. With my departure, no specialists in my field remain. In my time I worked at the Chernobyl nuclear power station and I know that everything began when teachers and speech therapists began to be appointed as operations engineers.

[Frolov] Why are you still not working anywhere? Will nobody hire you?

[Kuznetsov] No. A man who has been responsible for overseeing the operation of 26 energy units apparently is not wanted by anyone. At some stage a barrier emerges that is impossible to overcome. That has been the case in many places, the latest at Rosatom [Gosatomnadzor's successor agency]. [Kuznetsov ends]

It is interesting to know what this means: Whether they simply do not want to get into trouble or, what is far more terrible, this country really does not need professionals who can absolutely accurately define the extent of risk. Meanwhile the "ostrich" policy comes to the fore and actually is the most beneficial—let everything work as it does, until the first accident—which may be the last. Within only the last year Gosatomnadzor has witnessed an accident at the Leningrad nuclear power station, a radioactive leakage at a submarine base near the Norwegian border, and finally, Tomsk-7. Finally?

**Policy 'Paradox' Evident in Bryansk Chernobyl Zone**

93WN0413B Moscow SEGODNYA in Russian  
No 11, 27 Apr 93 p 7

[Article by Vera Romanova, under the "Paradox" rubric: "Standard of Living Higher in Russia's Contaminated Zone Than in Other Regions"]

[Text] Measures to eliminate the aftereffects of the catastrophe at the Chernobyl Nuclear Power Plant were begun in Russia significantly later than in Ukraine or Belarus.

Contaminated overall in Russia to one degree or another were 16 oblasts and one republic (Mordvinia). Seven thousand population centers, in which 2.4 million persons reside, fell into contamination zones. Initially following the accident, it was considered most effective to resettle people out of these zones. Regions of mandatory resettlement were designated for areas where the doses were greater, and voluntary resettlement—where they were less. But where is the border separating them from the "clean" oblasts?

When the accident occurred, norms permitted an individual to live at a very high radiation level—an accumulation of 75 ber [biological equivalent of roentgen] was allowed over a lifetime. Later, the 35-ber concept appeared, which itself was acknowledged as incorrect after long debates. Only in 1991, five years after Chernobyl, were the following doses confirmed: It was considered safe to receive 0.1 ber per year in addition to the natural background level; "protection" was required for those receiving 0.1-0.5 ber; and evacuation—for over 0.5 ber. True, in essence these norms do not differ any from the

35-ber concept—if you multiply the average life expectancy (70 years) by 0.5 ber, that is in fact the figure that you get.

Nonetheless, the state has stipulated no other limits, and the entire policy regarding rendering assistance to the victims of Chernobyl is based solely on them.

Inhabitants of population centers with cesium-137 contamination density of over 40 curies per square kilometer (an irradiation dose comprising more than 0.5 ber per year, per individual) are subject to mandatory resettlement. Some 4,400 persons fall into this category, who are expected to be resettled prior to the end of the first half of 1993. The work program encompasses expenses for the resettlement in 1993-1995 of not more than 16,000 inhabitants in the category of those desiring to leave the contamination zone. The threshold dose of 0.1 ber per year in addition to the natural background level is presently being received by 225,000 inhabitants of Russia residing in 785 population centers. The remaining 2,175,000 (6,015 population centers) are out of danger but, by decision of the Supreme Soviet, are subject to state protection.

However, the funds allocated by the state for elimination of the aftereffects of the catastrophe are spent on everyone in equal amounts. This means that over half the money is being spent on "charity," and there is not enough for those requiring greater assistance, believes Stanislav Troitskiy, adviser to the chairman of the State Committee on Chernobyl. In Moscow hospitals, for example, until recently there have been just 15 beds for the "eliminators" themselves....



Cs-137 Isotope Contamination of Soil in Bryansk Oblast

Key:—1. Novozybkov—2. Klintsy—3. Bryansk—4. 40 curies per square kilometer—5. 15-40 curies per square kilometer—6. 1-15 curies per square kilometer—7. Bryansk Area Has Suffered Most From Radioactive Fallout

Last year, one of every ten budget rubles went to the "Chernobyl Program." The draft budget for this year calls for allocating R11 billion [rubles] in 1991 prices to these ends. These funds go, by resolution of the Supreme Soviet, to the resettlement of people out of the most contaminated zones, to setting up amenities in settlements which were subjected to moderate effects of radiation, and to supplying their populations with "clean" products.

In other words, excellent standards of living, by our criteria, are being fashioned. And you see the result—far from everyone desires to leave. The process of returning local inhabitants who left is also actively under way. More than 1,200 people have returned to Bryansk Oblast, for example. They say that in order to get into "the zone" today, one has to have a great deal of influence. People are attracted by the benefits: two- to five-fold differences in salary, free medicine and medical care, "clean" food, long vacations....

The paradox lies in the fact that the state says it is better not to live in the contamination zones, but at the same time it is creating very good living conditions there. The effect is purely Russian. Not only do people not leave, but they live in contentment, gathering mushrooms—excellent carriers of radiation, catch fish, and drink milk from their own cows.

What is this—a policy not well thought out? Or, on the contrary—very well thought out?

#### Decree on Supplying Population with Radiation Monitoring Devices

935D0384B Moscow ROSSIYSKIYE VESTI in Russian  
4 May 93 p 3

[Decree No 327 of Russian Federation Government Council of Ministers, Moscow, "Procedure for Providing the Population with Radiation Monitoring Devices"]

[Text] In execution of the RSFSR Law, "Protection of the Environment," and with a view to providing the population with radiometric devices for monitoring the radiation level, the Russian Federation Government Council of Ministers decrees:

1. Approve the proposed list of radiation-monitoring devices for the populace that have been entered in the State Register and have been authorized for use in the Russian Federation.

2. Establish that the population is provided with radiation monitoring devices through specialized stores, the list of which is determined by bodies of authority of the republics within the Russian Federation and krays, oblasts and autonomous entities.

3. Bodies of executive authority of the republics within the Russian Federation and of krays, oblasts and autonomous entities:

determine the populace's requirement for radiation monitoring devices up to the year 2000 and within two months present an order for these devices to the Russian Federation Ministry for Atomic Energy;

call for priority provisioning of radiation-monitoring devices for citizens who live in areas that have been contaminated with radioactivity;

identify in 1993 the centers for radiation monitoring from among existing enterprises and organizations that service the population in the procedure established by the Russian Federation Committee on Standardization, Metrology, and Certification; and

recommend that the population that survives in radioactively contaminated territories, in evacuation zones, and in residential zones that have the right of evacuation be compensated for expenditures on acquiring radiation-monitoring devices, through funds that are earmarked for programs for eliminating the effects of radiation accidents.

4. The Russian Federation Committee on Standardization, Metrology and Certification:

develop and approve in two months a decree on the metrological status and the procedure for developing, producing, and calibrating radiation-monitoring devices for the population; and

inform bodies of executive authority of republics within the Russian Federation and of republics, krays, oblasts and autonomous formations, the Russian Federation Ministry of Atomic Energy, the Russian Federation Ministry for Public Health, the Russian Federation Ministry for the Ecology and Natural Resources, the State Committee for Sanitary and Epidemiological Inspection, the Russian Federation State Committee for the Social Protection of Citizens and the Rehabilitation of Territories That Suffered from Chernobyl and Other Radiation Catastrophes, and the Russian Federation Committee on Trade about changes in the list of radiation-monitoring devices for the population that have been put on the State Register and have been authorized for use.

5. The Russian Federation Ministry for Atomic Energy, in coordination with the Russian Federation Ministry of Economics and the Russian Federation Ministry of Finance, introduce to the Russian Federation Government Council of Ministers within two months recommendations on measures for economic stimulation of the production of radiation-monitoring devices for the populace as consumer goods.

[signed] V. Chernomyrdin, Chairman of the Russian Federation Government Council of Ministers

**Radiation Monitoring Devices for the Population That Have Been Put on the State Register and Are Authorized for Use in the Russian Federation, Approved by Decree No 327 of the Russian Federation Council of Ministers, 13 April 1993**

Designation of device	State Registry Number
Radiometer, beta radiation, Beta	11078-87
Radiometer, beta and gamma radiation, RKS-203 Pripyat	12096-89
Dosimeter, DBGB-01, Reton-901	12244-90
Indicator-alarm, gamma radiation, household, IRG	12294-90
Dosimeter, household, Master-1	12296-90
Dosimeter-radiometer, ANRI-01, Sosna	12305-90
Device, combined, for measuring ionizing radiation, RKS-104	12306-90
Dosimeter of power of equivalent dose, household DBGB-01K, Polesye	12352-90
Dosimeter-alarm, household, DBSB-08, Poisk-2	12354-90
Dosimeters:	
DBGB-07T, Nevskiy	12362-90
DBGB-07T1, Ladoga	12416-90
Dosimeter indicator DBGB-02, Don-01	12421-90
Dosimeter-radiometer IRD-02B	12422-90
Dosimeters, household:	
SIM-01	12481-90
Bella	12483-90
Dosimeter alarm, household, DBGB-20.01, Ros	12515-90
Dosimeter, stepped measurement, Polnye-101	12616-90
Dosimeter, alarm, DBG-05B	12707-91
Dosimeters, household:	
SIM-05	12/08-91
Grif-1	12717-91
DBGB-01, Rentgen	12725-91
DBGB-250, Orion-01	12622-91
Control clock with indication of radiation background, UChTs-0-3-02RF	12823-91
Dosimeter, household:	
DBGB, Binar	12824-91
DBG-07B	12825-91
DBGB, Foton	12826-91
DBGB, Lotta	12827-91
X-radiation indicator, household, Elekom	12828-91
Dosimeter-radiometer, beta-gamma radiation, household, DKS-01BZ, Argus	12925-91
Dosimeters, household:	
DBGB-04A, Baykal	12926-91
DBGB-01, Signal	12979-91

DBGB-11, Shaksna	12980-91
DBGB-04, motor vehicle, DBGB-04D	12996-91
DBGB-01F, Impuls	13140-92
RIF-01	13141-92
Dosimeter for external gamma radiation, household, Fon-B	13142-92
Dosimeter-radiometer, household, RKGB-01, Gorin	13212-92
Dosimeters, household:	
Bella	13271-92
ALARM-03	13272-92
PTF-02	13303-92
DBGB-01U	13323-92
Kvant	13356-92
Dosimeter-radiometer, household, IRD-02, 03B	13448-92
Dosimeter, gamma-radiation, household, DBGB-90, Kvarts	13464-92
Dosimeters, household:	
DBGB-06M, Altair	13465-92
DBGB-02, Skaut	13494-92

**Decree on Measures to Protect Biological Resources of Sea of Okhotsk**

935D0384C Moscow ROSSIYSKAYA GAZETA  
in Russian 5 May 93 p 5

[Decree No. 4824-1 of the Russian Federation Supreme Soviet, "Measures for Protecting the Biological Resources of the Sea of Okhotsk"]

[Text] Russian and foreign fishermen are carrying on unregulated destructive fishing of valuable types of biological resources in the central part of the Sea of Okhotsk. Such fishing threatens destruction of the reserves of fish that spawn in Russia's coastal waters and causes grave social and economic consequences to the population of the Far East's coastal areas.

Because questions of commercial fishing practices in areas that are completely surrounded by an economic zone of one coastal state are not directly stipulated in modern international maritime law, the Russian Federation Supreme Soviet decrees:

1. The Russian Federation assumes responsibility for preserving the living marine resources of the central part of the Sea of Okhotsk, which is completely surrounded by an economic zone of Russia, and for the administration of it, and, beginning 15 June 1993, is temporarily halting commercial fishing of the biological resources in this part of the sea by Russian and foreign ships until an appropriate international agreement has been reached.

The indicated measures in regard to commercial fishing for biological resources do not affect other rights of navigators that are recognized by international law.

2. The Russian Federation Government's Council of Ministers:

assure observance of the measures indicated in paragraph 1 of this decree;

propose to interested states that negotiations be conducted with a view to developing commercial practices for fishing for biological resources in the central part of the Sea of Okhotsk, which is completely surrounded by an economic zone of Russia; and

address the International Conference on Questions of Fishing in the Open Sea with a recommendation that it examine the question of regulating fishing in World Ocean regions that are completely surrounded by an economic or fisheries zone of one coastal state, and prepare the corresponding draft.

3. This Decree will take effect the moment of its publication.

[signed] Yu. M. Voronin, First Deputy Chairman of the Russian Federation Supreme Soviet  
Moscow  
House of the Soviets of Russia  
16 April 1993  
No. 4824-1

**Kurchatov Researchers Target Reactor Safety**

93WN0413C Moscow *IZVESTIYA* in Russian  
5 May 93 p 2

[Article by *IZVESTIYA* correspondent Andrey Illesh: "Physicists From Kurchatov Center Try To Create a Safe Nuclear Reactor"]

[Text] Nuclear catastrophes (serious accidents, in nuclear scientists' jargon) are well known to every school child by their aftereffects. For some, Chernobyl is just an image; for others—it is a lifestyle.... How can we avert catastrophes? And if all the same an accident occurs, are there means of keeping the radioactive products of fission inside the protective barriers of the nuclear power plant? For nuclear physicists, the answers to these questions mean everything—even the very existence of the nuclear power plant.

We know that during the accident at Three Mile Island (United States), the active zone of the reactor that melted down did not destroy the two final barriers. Both the reactor casing and the protective shell reliably performed their functions, and the incident itself did not grow into a global radioactive catastrophe. Alas, in Chernobyl everything was so much worse—they were unable to contain the melted-down active zone within the reactor.

So, under what conditions then will the reactor casing withstand overloads? Specialists will answer such a question—still not settled by science—only after serious

research is done on the most complicated physical-chemical and thermal-physical processes which accompany nuclear accidents. Up until quite recently, however, all of this was perhaps the concern of theoreticians alone. You and I reaped the fruits of radioactive contamination and demonstrated against the construction of nuclear power plants in principle. Perhaps we can continue to blame only the "physicist-murderers" for everything. But for me, who has written a great deal concerning nuclear catastrophes of the past and—alas—predicted troubles in the future, it is quite a new and rare occurrence to see that studies of this extremely complicated problem are under way at full speed at a Russian scientific center, the Kurchatov Institute. The work immediately attracted attention in the United States, at the NRC [Nuclear Regulatory Commission]—the celebrated commission on nuclear regulation. Moreover, the Americans opened up financing and have become full-fledged participants in the scientific program.

Finally, the Organization for Economic Cooperation and Development [OECD], or more accurately, the Committee on Nuclear Facility Safety, whose composition includes prominent experts in the sphere of civil nuclear-engineering safety from Europe, the United States, and Japan, has expressed interest in the research being conducted by the Kurchatov scientists. It was reported recently that the OECD met in session for three days at its staff headquarters in Paris. The ending of this session was a sensation—committee participants recommended that their governments allocate \$3 million for Russia (not an OECD member!). This is their contribution to the Russian scientific program for establishing safety in the event of any accident at a nuclear power plant. This fact is also important because a significant portion of nuclear scientists today only demand money from the state for their projects. But in our case, the unique experiments will not be expensive for our country. One final note. How many times do we have to convince ourselves that the most valuable thing we have in Russia is brains. The West is prepared to provide millions for our ideas and for Russian "executors." And they are doing so.

**Conference Studies Medical Aspects of Chemical Weapons Destruction**

93WN0427A Moscow *IZVESTIYA* in Russian  
14 May 93 p 1

[Article by Viktor Litovkin, *IZVESTIYA* staff: "Physicians and Scientists Seek a Safe Way to Destroy Chemical Weapons"]

[Text] The first Russian conference on the medical and environmental problems of the convention and international agreements on the prohibition of chemical weapons has opened in Moscow.

Participating in it are 13 academicians, 49 doctors of sciences, and representatives of Udmurtia, Chuvashia and Saratov Oblast, where it is proposed to begin the destruction of toxic substances. "Our goal," said Academician Anatoliy Kuntsevich, "is to find a method that would ensure the absolute safety of the population, people working at facilities, and the environment."

### Nuclear Industry Problems Viewed

934F0648A Moscow ROSSIYSKIYE VESTI in Russian  
19 May 93 p 7

[Article by Sergey Ovsyienko: "Weapons-Grade Plutonium Stocks Dwindling"]

[Text] The recent accident at Tomsk-7 prompted some of us to talk about a recurrence of the Chernobyl tragedy. Fortunately, this was not, as it happened, the case. But the serious incident at the Siberian Chemical Works has reminded us of the problems of the nuclear-weapons complex.

The former Union Ministry of Atomic Power and Industry had, according to its name alone, two areas of activity: atomic power and the military-industrial complex.

The second was primary, it is true—the country's first atom bomb was created in this department in 1949. And the first nuclear electric power station in the USSR was built just five years later at Obninsk, near Moscow.

The former prosperity of the nuclear-weapons complex is now just a memory in the Ministry of Atomic Energy of Russia (the successor to the Union department since 1992). It currently provides employment for approximately 150,000 persons scattered around 10 cities closed in accordance with the conditions of secrecy and security status. Approximately 1 million persons, 100,000 per "box number," resides in them altogether.

Striking changes have occurred here in the last eight to 10 years. In that same Tomsk-7 the extent of military production in 1986 constituted 80 percent. Now, speaking of the entire Ministry of Atomic Energy, the nuclear-weapons complex "draws" just 15 percent. Starting in 1987, the department has been actively dismantling the nuclear munitions. According to Minister Viktor Mikhaylov, approximately 13,000 nuclear munitions have been dismantled in this time, 2,000 a year on average. This is difficult work attended by danger to the health and, at times, to the life even of the personnel.

Thirteen reactors in the country formerly worked on the production of weapons-grade plutonium-239, now 10 of them have been shut down completely. The rest are operating because they are dual-purpose. Uranium-graphite reactors, for example, may and do supply a city of 600,000 inhabitants with heat and electric power. After all, each of these reactors "issues" approximately 200 megawatts of electric power.

Alas, the state evaluates both this labor of and this danger to the employees of the complex very modestly: average earnings a month to six weeks ago amounted to 25,000 rubles [R] a month. And the labor of people employed in departmental research was evaluated even more modestly—R15,000. It never rains but it pours: Many enterprises of the military complex are receiving and issuing their employees, with delays of a month and, at times, two, paltry pay.

Having commenced conversion, the sector immediately began to spin its wheels, and the enterprises lack working capital, are up to their eyes in debt, and are insolvent. Not expecting heavenly manna from the state, which the nuclear-weapons complex had formerly brought into the ranks of the superpowerful, the enterprises are seeking new forms of organization, creating concerns, forming stock companies....

And (a miracle!) last year the department achieved a growth in the production of civilian output of... one percent. There is—if only this—some growth, there is a trend toward the better. The first quarter of this year also implanted optimism in the hearts of the nuclear engineers—the increase in the "peaceful" product amounted to six percent, and this product included, for example, milk-processing complexes.

Since 1986 the ministry has had eight conversion programs, which have now acquired federal status. Their purpose is the assimilation of the industrial manufacture of high-technology and competitive products, in the sphere, for example, of radiation medical equipment, radioelectronics, its component base.... The ministry's entire research-design potential has been enlisted for the realization of these programs, which are of great significance for the country.

What will result from this, time will tell, and this latter very often makes its adjustments to all good undertakings. Demand has fallen off sharply at that same milk-processing complex—the Ministry of Atomic Energy's contribution to the agrarian sector of the economy. Not because it is inefficient, no, the nuclear engineers tried hard. But because there has been a sharp upward leap in the prices of these essential products.

Generally, Russia's atomic sector is suffering from the same ailments as our entire economy. And will surely recover from them when the Russian economy is firmly back on its feet.

### WESTERN REGION

#### Belarus: Government Adopts Decision on Contaminated Forests

WS2212133392 Minsk BELINFORM in Russian  
1105 GMT 18 Dec 92

[Text] The Belarusian Council of Ministers has adopted a decision to establish specialized forest farms in Gomel Oblast, on the territory contaminated with radionuclides, which is not suitable for agriculture and forestry. Their responsibilities include the protection of forests from fires, the area's deforestation, the protection of wild animals and the regulation of their number, the control of wood production and use, and the maintenance of an ecologically stable environment.

The State Chernobyl Committee of Belarus has been charged with financing these specialized forest farms by using the additional funds allotted to implement the state program on overcoming the effects of the Chernobyl disaster.

### **Ukraine: Environment Ministry Backs Chernobyl Phaseout**

*93WN0417A Kiev PRAVDA UKRAINY in Russian  
5 May 93 p 1*

[Release from the Ukrainian Ministry of the Environment Press Center: "Chernobyl Nuclear Power Station: The Ministry of Environment's Position"]

[Text] As is known, in October 1991 Ukraine's Supreme Soviet decided to completely shut down all still-functioning power generating units at the Chernobyl Nuclear Power Station [ChAES] by the end of the current—1993—year. Currently, however—in particular, at the high government and parliamentary level—the possibility, and even necessity, is being discussed and substantiated for the continuation of the utilization of the ChAES power generating units.

In this connection, the Ministry of the Environment believes that it is necessary to present its point of view on the problems that concern every citizen of Ukraine.

What arguments are being put forward by the apologists and supporters of a repeal of this decision of the Supreme Soviet?

**First argument.** Now, they say, when our young state is living through a severe economic crisis, suspension of operations of the ChAES will inflict tremendous economic damage and will exacerbate the difficulties in supplying the national economy with electric power.

Let us, however, finally get the fuels and energy sector in Ukraine in order. More than half of the power we generate is used to meet the needs of industrial production. Energy-intensive industrial sectors account for a disproportionately large part of it; ferrous metallurgy alone, with its obsolete, environment-polluting technologies and equipment—consumes one-quarter of all electrical power produced.

The strategic line is clear: Instead of pursuing a maximum increase in the electric power production—as a rule, at the expense of our children's future—we need to learn to use the existing, and rather substantial, energy potential most effectively and most economically.

**The second argument** of the opponents of shutting down the Chernobyl power generating units is that over the past few years considerable work has been done on increasing the safety level of the power generating units and that now a failure of the kind that took place in 1986 could not happen again.

Well, the work has indeed been done. But it is also well known that in the opinion of domestic and foreign

experts, RBMK-1000 reactors installed at the ChAES have principal design shortcomings, which are impossible to completely correct in the process of utilization. Some of them have not even been analyzed yet.

Let us not get into technical details whose full extent is understood only by specialists. Let us just establish the fact that even after the implemented modernization, the current safety level of the RBMK is not acceptable from the standpoint of international safety standards and even the regulations of the former USSR. The proof of that are numerous so-called "off-the-books situations" that have taken place both at Chernobyl and at the Leningrad, Ignalina, Smolensk, and Kursk nuclear power stations, which are equipped with RBMK reactors.

Let us also recall that the ChAES power generating units at the time of construction had been erected in the atmosphere of a rush, hustle, "ahead of schedule," and, of course, without proper control over the quality of work.

Therefore, who knows what other "fateful confluences of circumstances" awaits potential operators of the ChAES if a decision is made to continue its utilization?

On the same site with three functioning power generating units also stands the notorious "sarcophagus"—the "Enclosure" facility. How will a quite feasible serious emergency situation affect the unstable equilibrium in the "sarcophagus"?

Specialists note that there are still no criteria, defined in advance, of the economic, organizational, and technological acceptability and risk of continuing the ChAES operation. This makes it impossible to provide an unambiguous evaluation of the economic expediency of continuing the station's operation.

One can only guess at the astronomic magnitude, in the event of a new Chernobyl, of economic—and we are lucky if it is only economic!—damage to the Kiev region, Kiev, the Dnieper area, and Ukraine. And not only Ukraine. The risk is too great, and the kilowatt-hours that we may get from the ChAES power generating units are absolutely not worth it.

Now regarding the issue of social protection and finding jobs for the station's personnel. It is unlikely that this will present a serious problem. Skilled specialists will still be needed for a long time in the 30-kilometer Chernobyl zone. The Ukrainian Academy of Sciences is planning to set up here a scientific center for nuclear reactor safety. Some of the specialists will provide a partial solution for the problem of manning new power generating units of nuclear stations with a different type of reactor—if a substantiated decision is eventually made to lift the moratorium on putting them on line.

Keeping in mind all of the aforementioned, the Ukraine Ministry of the Environment considers the possibility of

utilization of the Chernobyl nuclear power station insufficiently substantiated and does not consider it expedient to change the Supreme Soviet decision on shutting down the Chernobyl nuclear power station.

## CAUCASUS/CENTRAL ASIA

### Armenia: Environment Official on Armenian Nuclear Power Plant

934K1143A Yerevan YERKIR in Armenian  
13 Mar 93 p 2

[Interview with Samvel Shahinyan, chairman of the Republic of Armenia Academy of Sciences Commission on Environmental Protection and Natural Resources, by YERKIR correspondent; place and date not given: "The Nuclear Power Plant Is a Political Instrument"]

[Text] The person with whom we are talking is Chairman of the Republic of Armenia Academy of Sciences Commission on Environmental Protection and Natural Resources Samvel Shahinyan, who has recently returned from a trip to Austria and Italy.

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[Shahinyan] I took the trip on my own initiative. It was necessary to come up with answers about the hysteria concerning the nuclear power plant and about the potentially erroneous conclusions of certain scientists concerning reopening the nuclear power plant which have been voiced in recent months. Unfortunately, this was not done by executive bodies, those entities whose job is protection of the environment. On the contrary, the nuclear power station had become a means of justification, to which they can cling to in order to hide their own sins. They create the impression that, following restarting of the nuclear power station, all problems will be solved. Everyone knows very well, however, that the nuclear power station will meet only 20 percent of our energy needs. I do not hesitate to say that the nuclear power station has today become a political instrument in the hands of government authorities, which is being used not in our external but rather our internal political affairs.

No environmental or energy policy is being carried out today in our republic; the authorities have no definite program. The three environmental laws are being violated in a gross fashion: the law on environmental protection, the basic law on the environment, and the law on mineral resources. The Supreme Council has been turned into a law-producing scientific research institute.

I am mentioning all of this so that the motive behind my trip will be clear.

In Austria and in Italy I met with the director of the International Atomic Energy Agency [IAEA], Hans Blicks, with representatives of Greenpeace and of Green Group organizations, as well as with Ripo Demiano [names as transliterated], Italy's minister of energy. The

most important meeting was with the director of IAEA, because it is this organization which is the primary supporter of reopening of our nuclear power station. During our meeting I was able to determine one thing: we cannot expect any support from these organizations. All of my arguments concerning an across-the-board ban on restarting the nuclear power station were rejected by Bicks, who stated that, according to information which has reached them, the Armenian nuclear power station does not pose any danger.

I probably would not be wrong in stating that from their standpoint it would constitute a unique experiment of some interest. Today there exist in Europe 28 nuclear power stations of the same type, which could be activated for political reasons at a moment's notice. Let us also not forget the international nuclear power industry people, for whom profit stands above all else.

The Austrian and Italian newspapers, Greenpeace and Green Group organizations responded with great interest to my visit. The latter promised to assist Armenia in all ways to do away with the energy blockade and to prevent reopening of the nuclear power station.

I can say that to a certain degree I reached my goal. First of all, I have kept the public informed about the possible calamitous consequences of restarting the Armenian nuclear power station and, secondly, I found organizations willing to support us.

### Kazakhstan: Temirtau Requests Designation as 'Disaster Area'

93WN0417B Moscow RABOCHAYA TRIBUNA  
in Russian 8 May 93 p 2

[Report by RABOCHAYA TRIBUNA staff correspondent Vyacheslav Kokhanov: "Are We Going To Live in a Dump in the Year 2000?"]

[Text] Temirtau—People's deputies from the city of Temirtau, which is home to metallurgists of "Kazakhstan's Magnitogorsk," appealed to the republic's Supreme Soviet with the request to immediately designate their city an ecological disaster zone. There are 4.5 tonnes of hazardous pollutants discharged here annually for every city resident! One of Temirtau's foreign guests said, without beating around the bush: "I think that the people who did the city planning here were total idiots." He himself was from clean France, so the guest could hardly have a feel for Temirtau's heroic history: The construction was done by Komsomol volunteers and settlers, who at the time did not give much thought to ecology and aesthetics. Now it is time to pay the price. The city ended up being encircled by industrial waste dumps, and on a windy day gets enveloped in a dense smog containing every element in the Mendeleev periodic table. In volume, the proportion between usable city area and the dumps is approximately 50:50. The deputies are extremely concerned with the trend: Each year, stored waste eats up 30 hectares of city land. At this pace,

the "masters of metal" may find themselves living entirely in a dump as early as in the beginning of 2000.

### Kazakhstan: Nuclear Reactor Shutdown Threatens Mangyshlak Peninsula

*LD1904161393 Moscow ITAR-TASS in English  
1456 GMT 19 Apr 93*

[By ITAR-TASS correspondent Fedor Ignatov]

[Text] Alma-Ata April 19 TASS—The vast Mangyshlak Peninsula in Western Kazakhstan can turn into a disaster zone if a nuclear reactor in the regional centre of Aktau stops.

It is now time to recharge the reactor operating on fast neutrons, but Russian and Ukrainian enterprises refuse to supply nuclear fuel, since the Kazakh power plant did not pay nearly seven billion roubles for deliveries made earlier.

Besides, chemical reagents used in desalination installations are coming to an end. These installations supply drinking water to the regional centre and major industrial enterprises in the area.

In turn, enterprises situated next to the power plant owe approximately seven billion roubles to the nuclear station, but they are on the verge of bankruptcy.

The situation could be drastically changed by the Koskor Joint Stock Company, the plant's main debtor. But the republican government is dragging its feet with issuing a licence for exporting mineral fertilizers, the company's main product, outside Kazakhstan.

The situation at the nuclear plant is aggravated by the outflow of skilled personnel. Eighty per cent of specialists, including seven nuclear physicists, have left the region. Another 400 workers "are packing their suitcases".

Specialists go mostly to Russia. In the opinion of the plant's Chief Engineer Petr Nazarenko, the outflow can be stopped "only by a dual citizenship of Russia and Kazakhstan.

"Otherwise, a shortage of skilled personnel can seriously interfere with the stable operation of the nuclear reactor. But the Kazakh Constitution does not permit people living in the republic to have dual citizenship".

The plant's workers pin great hopes on the coming meeting between Presidents Boris Yeltsin and Nursultan Nazarbayev to be held in May on issues of Baykonur, The former Soviet Union's largest cosmodrome situated in Kazakhstan.

### Kazakhstan: President Nazarbayev Chairs Ecological Meeting on Aral Sea

*LD1904200293 Moscow ITAR-TASS World Service in Russian 1100 GMT 19 Apr 93*

[By KAZTAG correspondent Anatoliy Shevelev for TASS]

[Text] Alma-Ata, 19 Apr—The first sitting of the board of the inter-state fund for the salvation of the Aral Sea was held here today. The foundation was set up at the Kzyl-Orda conference of Central Asian heads of state in March this year.

Stressing the importance of the Kzyl-Orda meeting, Kazakhstan's President Nursultan Nazarbayev, who was chairing today's sitting, said that such large-scale common problems could only be solved successfully through joint efforts. It was now time to go further, to start allocating money to the fund. The allocations should amount to up to one percent of the republics' budget, as originally envisaged in the conference resolution. The money will be used to finance state programs connected with the restoration of the [Aral] Sea and overcoming ruinous consequences of its shallowing.

Nazarbayev said that we all should be united in a campaign for healthy ecology and normal living conditions for the population of the Aral area. It should be hoped that alongside states, this campaign would also involve public movements whose activities are one way or another connected with the troubles of the Aral Sea, as well as humane entrepreneurs and patrons from all over the world. An appeal for their help should be made, and the fund's account number should be publicized.

## BALTIC STATES

### Estonia: Lake Near Sillamae Likely 'Second Chernobyl'

*WS2104100693 Tallinn BNS in English  
1933 GMT 20 Apr 93*

[Text] Tallinn, Apr 20, BNS—The lake near the town of Sillamae, Estonia, is likely to become a second Chernobyl, the local TV news program warned.

The source reported that during the post-war period the local enterprise cast 4 million tons of uranium waste, 1,200 tons of uranium, 1,000 tons of radium, 7,500 tons of thorium, 2 million tons of calcium sulphate chloride in the lake. The lake is five meters deep and only a few dozen of meters from the Finnish Gulf.

Andres Tarand, Estonia's environmental minister, says the lake poses no serious danger. Last year Finnish and Estonian scientists had examined the lake, he said, and came to the conclusion that there was no danger of nuclear explosion. But, the minister said, waste release in the Finnish gulf and radioactive contamination of the coast were confirmed.

The minister said 200 meters from the shore the situation was already normal. The drinking water taken from nearby wells is not contaminated.

No increase in radiation has been recorded at Sillamae and the level currently is 12-13 microroentgens per hour, in keeping with the established norms, said Yuriy Averbukh, deputy general manager of the state company Silmet.

Sillamae is a former off-limits town on Estonia's north-eastern coast. The pile accumulated from the former military chemical plant during much of the Soviet era in Estonia. Until last year, the plant dealt with uranium concentrate.

The deputy general manager told BNS no emergencies or radiation outflows had taken place at the plant.

#### Lithuania: Search for Missing Fuel Cartridge Continues

WS2104100893 *Tallinn BNS in English*  
1933 GMT 20 Apr 93

[Text] Vilnius, Apr 20, BNS—A special commission completed a repeated inventory of nuclear fuel at the Ignalina nuclear power plant, but still did not turn up the exact location of a missing fuel rod.

The commission was formed to carry out a control inventory after the plant discovered that one nuclear fuel cartridge was missing at the beginning of this year.

Genadi Negrivoda, Ignalina's chief engineer, said the supposed location of the cartridge was established. The search will continue inside the first reactor, but only after it is shut down.

The second block of Ignalina was shut down for maintenance repairs on the night of April 17 and will not operate until the end of June. The nuclear power plant does not plan to switch off the first block until then.

#### Lithuania: Scientist Examines Factors in Baltic Sea Pollution

934K1082C *Vilnius EKHO LITVY in Russian*  
22 Apr 93 p 3

[Interview with Oleg Sergeyevich Pustelnikov, candidate of geology and mineralogical sciences and lead scientific associate at the Geography Institute of the Lithuanian Academy of Sciences, by correspondent Galina Afanasyeva; date and place not given: "Staying Out of Step Is a Problem"]

[Text] We learned in school that the only people who reach the shining heights of science are those who tirelessly scale its rocky cliffs. In reality, however, the rocky slopes are not the only obstacle encountered by scientists who try to get to the truth on their own, without a safety belt. This is what our correspondent Galina Afanasyeva discussed with Oleg Sergeyevich Pustelnikov, candidate

of geological and mineralogical sciences, who has been studying the environment conditions of the Baltic Sea for 15 years as the lead scientific associate of the Geography Institute of the Lithuanian Academy of Sciences.

[Afanasyeva] That means you have spent virtually your whole life researching the Baltic and the problems in this zone.

[Pustelnikov] Not quite. I am an oceanographer. Although I am now studying the pollution of the Baltic seabed as a secondary source of pollution, I have been researching sedimentation processes in the sea for a long time. During my 25 years in science, I have sailed three oceans and 23 seas. I do biogeochemical research, which might be called the study of ecology from the other side: I study the interaction of living organisms with nature to learn how these organisms are influenced by their environment.

[Afanasyeva] The pollution of the Baltic Sea, which is being associated with human activity, is one of the most critical issues of the day. Does this connection exist, and is nature capable of curing itself or will this require additional human intervention in environmental processes?

[Pustelnikov] All of these conjectures are partly true. The local man-made problems in Klaipeda, Mazeikai, Kauunas, and Kaliningrad were connected with the absence of waste treatment plants while "dirty" production units were being installed. This is self-evident, but it would be wrong to exaggerate the effects of the anthropogenic factor. A specific approach to something of enormous scales can sometimes obscure the truth. A biologist who discovers that some kind of organisms have disappeared from the sea, for example, is most likely to blame this directly on human activity, saying that it disrupted the ecological balance, but there are also objective processes at work. Just consider the death of the dinosaurs on the planetary scale. It would be wrong to blame man for this. Hydrologists and geologists who are immersed in "pure" science frequently base their investigations of phenomena on the assumption that natural conditions are stable and static. The truth, however, probably lies at the point at which this kind of science converges with sciences studying the active biosphere. I feel that biogeochemistry is the link connecting them.

An examination of the history of the development of the Baltic zone over the last couple of thousand years from this vantage point, for example, reveals that many important events had no connection whatsoever with the anthropogenic factor, although some ecologists would try to blame them on human activity if they were to occur today. For instance, the Hanseatic League in the Baltic broke up because there was no more herring, the merchants' most lucrative commodity. The herring migrated to the North Sea because of changes in climate, and not because of excessive fishing.

[Afanasyeva] Then what is happening to the Baltic zone?

[Pustelnikov] At one time it and the Scandinavian countries were covered by a glacier. The pressure of this heavy weight compressed the land. Now the land is slowly straightening out. As a result, the north is rising and the south (Germany and Poland) is sinking. Finland is called the country of 100,000 islands, but it is also still called an "aggressor without a war." At one time much of its present coastline was under water, but the rise of the country is reclaiming around 2,000 square meters of land every 1,000 years.

This shoaling process is also changing the chemical composition of the water, its biosphere, and processes of sedimentation. The average depth of Kursk Bay today, for example, is 3.8 meters. It will cease to exist in around 1,000 years. Klaipeda will probably move away from the sea even earlier or become an inlet harbor. The Neman will not flow as far as Klaipeda or even Nida and might cut through the sand bar south of Nida (this process has been demonstrated by the erosion of the shore in the settlement of Morskoye in Kaliningrad Oblast), turn to the south, or run through the Deima River and along the Pregel to Kaliningrad Bay.

[Afanasyeva] This means that the pollution of Kursk Bay is a natural process, but is it possible that the beaches are closed each year for long periods of time because of natural processes?

[Pustelnikov] Unfortunately, the shoaling process does have undesirable effects, but it is a natural phenomenon. As for the ecologists who have said that the pollution of Kursk Bay will cause its disappearance in another 10 years or so, their German colleagues were making equally pessimistic predictions before the war. For some reason, all of them ignored the factor of self-cleaning properties.

When you look down from your own bell tower, you have your own view of everything as far as the horizon. The microbiologists and epidemiologists who discover a heightened concentration of microorganisms close the beaches without being overly concerned about the primary cause. The higher concentration is not the result of increased pollution. All of these organisms also existed in the past. At a certain temperature, however, they become more viable. When the temperature of the water rises to 18 degrees, for example, the process of reproduction is accelerated. When I conducted studies to analyze the liquid sewage the Mazeikiai Combine was discharging into the Baltic, I found no new microorganisms in the water. All of them had always been there. It was simply the rise of 5 degrees in the temperature, I repeat, that led to the heightened activity of these microbes.

[Afanasyeva] As I see it, your research is somewhat incompatible with the common opinion of ecologists with regard to the effects of human activity on current processes in the Baltic Sea and Kursk Bay.

[Pustelnikov] Yes, it is contrary in some respects to this opinion. The prevailing belief today is that the anthropogenic factor is to blame for the presence of heavy metals and hydrocarbons in Kursk Bay and the Baltic Sea. This is why few people are investigating differences in the occurrence of these elements. It is not a popular field of research. One of my former graduate students, Saulius Zareckas, recently managed to prove that approximately 63 percent of the hydrocarbons in the coastal waters of the Baltic are of natural origin. When ecologists discuss pollution, they rarely mention the natural seepage of oil from subterranean strata. This does occur, however, on the Lithuanian coastline and in Kaliningrad Oblast. They also forget that ground water containing various minerals, including enriched cobalt and nickel, also finds its way to the sea. Scientists who study natural processes are few in number today and, quite frankly, we have a difficult time breaking through the wall of silence.

[Afanasyeva] Have you been able to get through to anyone?

[Pustelnikov] That is a difficult question.... On the one hand, I have managed to publish several books on the Baltic Sea. A new book that came out in April, "The Biochemistry of Partially Enclosed Bays and the Anthropogenic Factor in the Sedimentation of the Baltic Sea," is a continuation of the works "The Biochemistry of Kursk Bay" and "The Effects of the Oil Spill on the Ecosystem of the Baltic Sea." The new work had a hard road to travel, as the saying goes, before it was published. There were many problems in financing the publication. For a variety of reasons, I am working alone now, and I do not have a research team or any assistants. Nevertheless, I have faith in the long-term value of this research, to which I have devoted all of my adult life, and I am not giving up. I also have the support of my colleagues abroad, where people have taken an interest in my works. I already have five invitations to various symposiums and international conferences this year (in Helsinki, Riga, Sopot, Amsterdam, and Copenhagen). Of course, I have to politely decline these invitations more frequently now. Although the organizers usually pay for my accommodations, I simply cannot afford the travel expenses. People in St. Petersburg, Kaliningrad, and Belarus have also taken an interest in my work. I believe I can be useful to Lithuania, where I was born and raised, and for the sake of which I am doing this work. This year, therefore, I want to address two international symposiums here—in Klaipeda and in Vilnius.

**Latvia: 'Ozone Hole' Noted Above Riga**  
*93WN0417C Moscow RABOCHAYA TRIBUNA  
in Russian 8 May 93 p 2*

[Report by RABOCHAYA TRIBUNA staff correspondent Vyacheslav Proskura: "And on Top of That a Hole in the Sky"]

[Text] Riga—An agreement between Latvia and Germany on cooperation in environmental protection has been signed in Riga. According to LETA Information Agency, K. Toepfer, the FRG minister of environment, environmental protection, and reactor safety, in his meeting with I. Godmanis, the chairman of the Latvian

Republic's Council of Ministers, urged Latvia to take extreme care with respect to Western mafiosi structures' attempts to export hazardous waste to the countries of Eastern Europe.

It so happened that the Latvian meteorological service also made an announcement on the same day: The thickness of the ozone layer over Riga is decreasing with alarming speed. It is currently registered at only 3.33 millimeters, 4.14. millimeters being the norm. The thinnest ozone layer registered recently over Riga and the shoreline was 1.9 millimeters. Specialists are sounding an alarm: "An ozone hole is forming; sunbathing presents a health hazard."

## NORWAY

Environment Satellite Station in Tromso  
Described

93WN0403B *Oslo AFTENPOSTEN* in Norwegian  
26 Apr 93 p 13

[Article by Rolf L. Larsen: "Seeing the World Via Tromso"—introductory paragraph in boldface as published]

**[Text]** Today there are two environment satellites circling the globe and only one receiving station in northern Europe that can pick up and pass along the data during storms, bad weather, and darkness. It is located in Tromso.

Norway is being assigned new and exciting tasks involving environmental surveillance from space. The Tromso satellite station is the only station that can receive signals and produce radar images from two of the world's most advanced environment satellites.

Several times a day a European and a Japanese environment satellite transmit important information on sea and land environments to a big parabolic antenna at the Tromso satellite station. Tromso has an ideal geographic location. Our northern station can pick up 10 out of the 14 passes the two environment satellites make in so-called polar orbits over the globe every 24 hours.

At the station the data is processed and sent on to environmental researchers all over Europe.

## Honor

It is the space organizations in Europe—ESA [European Space Agency]—and Japan—NASDA [National Space Development Agency]—that have given Tromso the task of receiving, processing, and passing along the satellite images.

"We regard this job as an honor for Norwegian space activity. The work also means that we will now expand the staff here by four people to a total of 22 employees," said station chief Einar Ellingsen and department leader Svein Minde of the Tromso satellite station.

"As well as providing an additional revenue of about 3 million kroner a year, the tasks will give both the station and Norway big opportunities to acquire new knowledge in the field of satellite surveillance of the earth's environment. During the 1990's other even more advanced environment satellites will be launched and the work we are doing now will put us in first place when it comes to expertise in this exciting and important surveillance field," the two said.

The Tromso station was selected to receive images from the Japanese environment satellite, JERS-1, because of the advanced Norwegian space technology there for reading environment satellites.

Reading data, processing finished images, and sending the information further via telecommunication networks and satellites takes about half an hour, the fastest time in Europe.

## Investments

This technology has now been expanded and the Norwegian industrial firms Informasjonskontroll, Scientific Project Contractors, and Spacetec have supplied the equipment. The FFI [Defense Research Institute] has carried out a substantial part of the research. The Tromso satellite station is part of the Norwegian Space Center, which coordinates space activities in this country. The European space organization ESA and the center have invested a total of about 56 million kroner in expanding and equipping the Tromso satellite station.

A unique environment has sprung up around the Tromso station. The Spacetec company is housed in the same building. Spacetec distributes satellite images to consumers around the world. The researchers here also play a central role in developing the equipment that reads the data from the different satellites. Spacetec currently employs about 40 people. The Tromso-based Akvaplan-Niva company has also specialized in data services in the area of earth observation.

## Big Possibilities

It is estimated that a total of about 100 people in industry and research are associated with the space activity in Tromso today.

Earth observation technology is currently at the developmental and demonstration level internationally. Norway is at the leading edge of this area of space technology. There is now a solid basis for building up a commercial industry in this area. This could give Norway the same kind of economic profits as satellite communications, according to the Norwegian Space Center.

## Satellite Can See Oil Spills

The SFT [National Pollution Inspectorate] will use an environment satellite to keep an eye on oil spills in our part of the ocean.

The inspectorate's oil safeguard division in Horten and the Defense Research Institute in Kjeller will start up a pilot project in a few weeks to survey oil spills with the help of an environment satellite.

"We have already made quite a few studies of this kind of surveillance together with the FFI and the perspectives are very interesting," said division engineer Jorn Harald Andersen of SFT's oil safeguard division in Horten.

It is the European environment satellite, ERS-1 [European Remote-Sensing Satellite-1], that will be used to

keep an eye on oil spills. The satellite is in orbit over Norwegian ocean waters and the data is picked up by the Tromso satellite station.

#### 200 Discharges

From there the pictures are sent on to the Defense Research Institute in Kjeller where they are analyzed. As soon as the FFI researchers detect oil spills on the pictures they call up the SFT in Horten which has someone on duty around the clock. The location and coordinates of the pollution are then transmitted via telefax.

"We will then send our SFT plane up to study the spill more closely and try to determine where the oil came from. Thus satellite observation can be an important supplement to airplane observation," said the division engineer.

The Coast Guard also uses data from environment satellites. Ships can be seen with both satellites. So far using the two satellites has shown that the Japanese satellite is better at "observing" ships than the European one.

"The experiences we have had with the ERS-1 satellite exceeded all expectations. We have acquired a very important tool for environmental researchers," said Prof. Ola M. Johannessen of the Nansen Center for the Environment and Telemetry in Bergen. "We also have great hopes with respect to data from the Japanese JERS-1 and the other environment satellites that will come later in the 1990's."

The Nansen Center uses the satellites primarily to survey ice in northern areas. With the help of the ERS-1, the center now gathers important information on ice conditions that will be useful for the fishing fleet, the oil industry, and other ships sailing in northern areas.

#### Ocean Data

Meteorologists and oceanographers also find the environmental data that the Tromso station picks up from the European satellite very useful. The satellite gathers information on ocean surface temperatures around the world. The British Meteorological Institute receives this data from Tromso and uses it to build up a global meteorological service in this area.

[Box, p 13]

#### Environment Satellites

The satellites are packed with advanced technology. The radar equipment on board is especially important in enabling the satellites to provide more reliable data from space than any previous earth observation satellite. With the radar the satellites can "see" in the dark and penetrate fog, rain, and clouds. New environment satellites launched in the mid- and late 1990's will also contain equipment for measuring the ozone layer.

The environment satellites will gather important information on the health of the earth. Uses range from taking the environmental pulse of the world's oceans to providing important information about rain forests. The satellites can observe ice and measure wave direction. A continuous record can also be made of wind strength at the ocean surface, ocean temperature, and currents. Researchers can also collect important data that can provide new knowledge on the greenhouse effect and the distribution of the earth's weight. The satellites can also "see" ships. All the environment satellites move in so-called polar orbits 600-800 km out in space.

Information from environment satellites could have great importance for the ocean-based oil industry, shipping, the fishing and ocean resource industry, and pollution authorities. Researchers in a number of fields will find the satellite pictures very useful in such areas as oceanography, meteorology, geodesy, and environmental protection.

The first satellite in the new generation of earth observation satellites—the European ERS-1—was launched in the summer of 1991. The Japanese JERS-1 went up last year and the next European environment satellite—ERS-2—will be launched at the end of 1994 or early in 1995.

Environment satellites cost around 3 billion-9 billion kroner.

#### Country's Only Dump for Inorganic Waste Described

93WN0403A Oslo AFTENPOSTEN in Norwegian  
28 Apr 93 p 13

[Article by Eivind Fossheim and Sveinung Berg Bentzrod—introductory paragraphs in boldface as published]

**[Text]** Langoya will be developed as a central facility for inorganic waste—acids and heavy metals—that cannot be "spirited away" today. This was announced by Eirik Wormstrand, director of the Norwegian Special Waste Company (NORSAS). He stresses employee training.

Last year 90,000 tons of problem waste from households, private industry, and public enterprises was collected at nine regional sorting facilities. Some was burned, some recycled, and the rest was dumped in various locations. Langoya also received waste directly from industries.

#### Handling Special Waste

It is the half state-owned NORSAS company that administers the flow of special waste in this country. Its job is to ensure that the collection, reception, and treatment of all waste occurs in a safe and efficient way. Because a lot of the waste is dangerous to humans and animals as well as our natural environment, director Wormstrand

assigns special importance to providing proper training for the people who are in charge of managing and treating it.

"Some 315 municipalities are currently involved in collecting special waste from households and other small users. Our goal is to get the remaining 113 signed up in the course of the year," he said.

Forty firms have concessions to collect special waste and deliver it to the nine regional receiving and sorting facilities. Wormstrand said that several of the regional plants have laboratories and personnel with chemistry credentials. It is a clear rule that unknown substances are never mixed together.

In the regional facilities the waste is sorted, analyzed, and then packed and sent to an assortment of 38 final treatment plants which incinerate the waste, store it, or recycle it. "Special waste that we are unable to take care of in Norway today is exported to places like Sweden and Finland," Wormstrand said.

#### Waste Oil

Last year 90,000 tons of special waste was received, 33 percent more than the year before. The increase was largely due to oil drilling, but there was also a larger amount of used lubricating oil. Most of the 33,000 tons of waste oil was used as industrial fuel.

Although NORSAS enters into cooperative agreements with more and more new treatment plants, Norway still has an inadequate supply of treatment facilities. Since the plans for Hjerkinn were put on hold the need has increased and Norwegian Waste Disposal, Inc. (NOAH), which must accept all categories of special waste, is developing a plant on Langoya that will play a central role in the final treatment of inorganic waste, heavy metals and acids that cannot be incinerated or recycled.

#### Increasing Efficiency

Today liquid organic waste goes to Dentor, Inc., in Larvik, where chemists analyze it and convert it into fuel mixtures for Norcem.

The collection and treatment of special waste is constantly being improved and made more efficient. In the past it cost up to 70,000 kroner to dispose of a ton of PCB. Today it costs 30,000 kroner. It currently costs from 500 to 1,500 kroner per ton to dispose of waste oil. Director Wormstrand stressed that the costs of waste treatment are being charged to the producer to an increasing extent. It is true that this makes products more expensive to buy, but on the other hand the consumer does not have to pay for the disposal of the waste products.

#### Negligence

NORSAS has conducted a number of courses for personnel who are responsible for the practical handling of special waste, and the company places great emphasis on

improving workers' competence and qualifications. For safety reasons it is especially important that special waste contractors are careful about filling out declarations and descriptions of substances for carriers and receivers.

"There is a great deal of negligence here," said Wormstrand, who noted that in several cases the police have revoked the registrations of trucks containing special waste because the carrier did not have a proper declaration.

#### New Regulations

Under current rules firms have no obligation to deliver waste such as strong acids and bases to approved receiver facilities. When the regulations were drawn up 10 years ago there was no system for handling this kind of waste. It has been up to the firms themselves to take care of the waste and dispose of it safely.

"We have been concerned by the fact that companies were storing these strong acids and bases," said section chief Sigurd Tvedt of the National Pollution Inspectorate.

Having dangerous substances stored at different companies around the country has not been a satisfactory arrangement. Tvedt feels the new disposal site on Langoya will provide a secure depository for such waste. Therefore the new regulations that will take effect soon also cover these substances, Tvedt said.

#### Scenic Spot, Acid Depot in Oslofjord

The limestone on Langoya makes the scenic spot a unique place for storing so-called inorganic industrial waste.

NOAH Langoya is set up as Norway's biggest collection site for inorganic waste, including sulfuric and hydrochloric acid. There are plans to make large investments in expanding and safeguarding the facility.

Among other things the plant receives around 150,000 tons of sulfuric acid a year from Kronos Titan in Fredrikstad and around 20,000 tons of hydrochloric acid from Norsk Hydro. The cargo of 18,000 liters of nitric acid that caused the gas accident on Monday came from Borregaard.

Acids and bases are first collected in one of several limestone craters. From there water is used to flush the huge amounts into a neutralizing plant where the acids are neutralized. The excess water is cleaned and discharged into the fjord. The heavy metals that are removed are mixed with plaster mass and stored in barrels. The plaster will be used as fill when the treatment facility for special waste is closed sometime in the future and Langoya becomes exclusively a recreation area once more.

So far the National Pollution Inspectorate has been most concerned with whether toxic liquids have leaked from the facility. According to director Harald Rensvik no leakage has been detected.

#### Outdoor Life

While the middle section of the island receives industry's problem waste the northern and southern ends provide a beautiful scenic experience. The island is the closest outdoor recreation area for 10,000 people and in the summer months it hums with activity.

Langoya is also famous for its fossils and is a unique geographic and botanical area. Before Aker Norcem established itself here there were plans to create a big lagoon on the island. Today chairman Olaf Brastad in Holmestrand is toying with the idea of making part of Langoya into an enormous concert facility. The goal of the municipality is to elevate the island's status as an outdoor area in parallel with the buildup on the waste side. The island lies just offshore from Holmestrand.

[Box, p 13]

#### This Is Langoya

- Location: Vale township, Vestfold.
- Size: Approximately 3 km long and one-half km wide.
- Inhabitants: None.
- Industry: Limestone quarry for Norcem's cement production from 1899 to 1985 when Slemmestad Factories closed.
- Waste: Norcem set up Environmental Industry, Inc., a receiver for industrial problem waste, when limestone quarrying ceased. The company was in operation up until 1 March of this year when NOAH bought the waste depot. In 1989 the company began accepting acid from Kronos Titan in Fredrikstad.
- Amount received: 300,000 tons of inorganic waste a year, most of it sulfuric acid from Kronos Titan.
- Planned operating period: 30-40 years.
- Geology: Limestone, which has the property of becoming totally impervious when it reacts with salt water. This is what makes the island suitable as a dump site for inorganic waste.

#### Special Waste Delivered in 1992 (in tons)

Waste oil	32,896
Oil waste from industrial cleaning	9,626
Oil drilling waste	33,593
Oil emulsions	1,747
Organic solvents with halogen	196
Organic solvents without halogen	2,290
Paint, glue, enamel, printing pigment waste	2,825
Distillation residues and tar waste	264
Waste containing heavy metals/batteries	951
Waste containing cyanide	9

#### Special Waste Delivered in 1992 (in tons) (Continued)

Discarded herbicides and insecticides	12.7
Waste containing PCB	13.1
Isocyanates	14.3
Other organic waste	1,330
Strong acids	422
Strong bases	173
Other inorganic waste	1,087
Aerosol cans	3.6
Laboratory waste	28.9
Unknown	1.2
<b>Total</b>	<b>87,483</b>

#### Report Recommends Obligatory Pilot for Hazmat Ships

93EN0463Z Oslo AFTENPOSTEN in Norwegian  
29 Apr 93 p 6

[Article by Rolf L. Larsen: "Wants Pilot Duty for Ships With Dangerous Loads"—introductory paragraph in boldface as published]

[Text] Ships with dangerous loads must have pilots along the whole coast. Ship captains must have a pilot's license—waterway license—in certain areas.

These are some of the most important measures a public working group has proposed to improve environmental security in Norwegian waterways. The group has worked for two years, and Tuesday [27 April] it presented its extensive report of over 400 pages. The report was delivered to Coastal Director Ole Vatnan.

The group also proposes, among other things, these measures: large tankers and cargo ships must sail farther from Norwegian coasts. Such ship types of over 35,000 dead weight tons must be advised to sail at least 35 nautical miles from the coast. A limit of 5,000 tons must be set for transit sailing in coastal waters. During sailing from and to the sea, the path of least risk must be used.

Between 70 and 90 million kroner must be invested in sea surveying and in the development of new sea charts. About 70 million kroner for the development of new lighthouses and markers. Altogether, 250 million kroner must be set aside to ensure safety along the Norwegian coast.

Traffic supervising centers must be built for ship traffic in the Oslofjord and Rogaland. And this will require a further investment of 100 million kroner.

#### The Pilot More Important

The working group puts great stress on the pilot's future role in navigation in Norwegian waters. "A regulation on

the use of pilots must be established for the whole coast that ensures safety in the broadest sense. The rules must be adjusted according to the waterway, the size of the vessel, the type, load, maneuverability, and navigator's competency," Section Director Svein Ording of the Coastal Directorate said. Ording has led the working group. In addition, 16 local groups have participated in the development of the report.

The working group says that the pilot must be considered the chief representative on board of the sea and coastal authorities. Among other things, he must be given authority to order tugboat assistance if it is necessary. A ship that quite clearly can be dangerous to environmental security can be stopped before it comes into Norwegian coastal waterways.

Ording is concerned about recruitment for pilot positions in the years to come. We have today about 250 government pilots. "We need to recruit 15 to 20 pilots a year, and we are beginning now to note that there is a shortage of maritime workers in this country. This can mean problems for us in a few years," he said.

The areas along the Norwegian coast have sea charts that are over a hundred years old. They are made on the basis of sea surveys from 1878 and beyond. This applies especially to the southern and northern coasts of Norway. There is need for a greater prioritizing of this work. If we continue as we are doing today, the Norwegian coast will not be surveyed and have new sea charts before about the year 2020.

There is also a need for the development of lighthouses and signal duty, particularly in waters with increasing rapid-boat traffic. Most of these boats sail today in Rogaland, Sogn, and Fjordane, Trondelag, and Nordland.

#### Supervision

The working group points to good experience with traffic centers in Grenland and Mongstad. Therefore it wants similar centers to be built to supervise ship traffic in the Oslofjord and Rogaland.

The group thinks that statistics on sea accidents are not good enough in this country. Therefore a permanent shipwreck commission should be established that deals with accidents and near accidents at sea. The commission should be set up with a view to being able to evaluate all relevant conditions that apply to the crew, the vessel, the cargo, and the waterway in which the accident took place.

#### Communist Heritage of Pollution Discussed

##### Holst: Nuclear Test Ban Urged

93EN0453Y Oslo AFTENPOSTEN in Norwegian  
29 Apr 93 p 15

[Unattributed article including interview with Foreign Affairs Minister Johan Jorgen Holst; place and date of

interview not given: "Nuclear Threat Must Be Eliminated"—introductory paragraph in boldface as published]

[Text] While new agreements on disarmament are being considered, money must be spent to implement the existing ones in a responsible manner. If not, disarmament will become an environmental threat, Minister of Foreign Affairs Johan Jorgen Holst believes.

The foreign affairs minister rates the Russian nuclear threat henceforth as one of his most important projects. On 5 May, he will travel to Washington to tell the Americans what he has just told the Russians:

Cleanup after the cold war's arms race must be given top priority, an agreement on a ban of nuclear weapons testing must be reached. A close and open cooperation between the West and Russia's military forces must be a prerequisite, if the democratization of the former superpower is to succeed. And nuclear weapons in Ukraine must be removed as soon as possible, without concessions. As a neighbor of the world's largest nuclear-powered submarine fleet and radioactive waste dump, Holst regards Norway as a direct participant in the biggest cleanup action of our times.

[AFTENPOSTEN] The military threat against Norway has been supplanted by a steadily mounting threat against our health and our environment. Is this just as difficult to tackle?

[Holst] It is very different, very complex and difficult to solve. But just like the military threat, which is still present, this is not something Norway can tackle alone. We are wholly dependent upon resources and technology from the United States and other Western countries. Currently, we know too little about the details of Russia's environmental crisis. Except for the most urgent safety precautions, we must first do some careful charting. Afterwards, we can set our priorities concerning what is important.

Holst sees three primary elements in the nuclear threat against Norway: Waste disposal from the icebreakers and nuclear submarines, the reactors dumped in the sea, and the nuclear power plant Polyarniye Sori.

"We must quickly gain access in order to control the waste disposal sites and aid in sealing everything that has a danger of leaking. Because a large number of submarines must be put out of operation and all of Russia's strategic submarines will presumably be stationed on Kola in the future, there must be a permanent solution for the waste in that area. When I visit the United States in May, I will say we would like the Americans to join in working with Russia on this matter," Holst said.

He is concerned about potential rumors in the future of radioactive fish in the north: "For this reason it is important that we can monitor and eventually cooperate in removing the reactors dumped into the Kara Sea."

The foreign affairs minister emphatically dismissed charges that Norway's appropriation of 20 million kroner for the nuclear power plant on Kola will act like a sleeping pill and foster false security in the region. Estimates show that it will cost a billion or more to bring the plant up to Western safety standards.

"Twenty million is a significant sum to us and it will help to improve safety somewhat. But we have never said that Norway could be the principal actor in this project," Holst said. Furthermore, he has his doubts as to whether the whole story on nuclear dumping has yet been revealed. "I am prepared for new surprises," he said.

[*AFTENPOSTEN*] How does Russia's military currently view the radioactive environmental threat?

[Holst] Recognition of the crisis is growing. But there is much psychology involved here. The Northern Fleet is a proud institution; it was an important instrument of the superpower. They do not like to be referred to as an irresponsible outfit. That is why I constantly repeat that I do not wish to place any blame. I would like to see a joint effort tackling a common problem. We must have the military on our side and not against us, if we are going to be able to solve the problems of the North.

The Russian military is key to whether the Russian democratic experiment succeeds. Today their view of the West is full of mistrust, largely stemming from ignorance. If we manage to construct a working arrangement on nuclear waste and disarmament, the bonus can be openness and trust. In this way, we may be able to prevent the military from going into a coalition with antidemocratic forces.

[*AFTENPOSTEN*] Can environmental cleanup and disarmament become important elements in the conversion of the Russian military-industrial complex to civil production?

[Holst] Kvaerner's involvement in building trawlers in Severodvinsk and the Russian's own plans for building fast trains and submarines for civil transport are an indication that something is already happening. Such conversions are potentially the most important thing we can contribute to. Russia has an enormous scientific capability in the technomilitary sector. The Soviet Union was never able to put this knowledge to work in the civil sector. Russia does not want developmental aid, rather cooperation between partners. They have know-how, but they have a big problem with investment.

Holst is afraid that the Russian military-industrial complex can become very export oriented, if conversion does not succeed.

"The environmental crisis is so extensive that we need a proper overview before we can begin to prioritize what is most important. This is happening in a period when we all have economic problems and we do not have the funds we would like to have. Furthermore, environmental cleanup is a bit low on the list of priorities for

Russia and the rest of East Europe, given that their main goal is to reconstruct their industries and get their economies up and running."

Holst does not agree with the criticism that the West has been too preoccupied with exporting its own technology: "Over the short term, the Americans and we others are most interested in safety, responsible storage, and the destruction of nuclear weapons which must be eliminated. During such a phase it is natural to use existing western technology. Over the long term, the development of Russian technology is naturally a high priority," he said and is reminded of the cost of disarmament:

"While further disarmament is being evaluated, we must concentrate on how we are going to implement the agreements we already have. The funds freed up from the arms race should be used for responsible storage and destruction," said Holst, and laid out clearly what this year's top priority projects should be:

"For years, technical arguments for ending nuclear weapons testing have been lacking. With the present administration in Washington and Russia's promise not to breach the provisional moratorium first, we have a unique political opportunity. I will do my utmost to effect a lasting ban," said Holst.

[*AFTENPOSTEN*] What is your feeling about Ukrainian leaders' warning that they will hold on to nuclear weapons in their territory until they have received promises of large-scale western economic assistance?

[Holst] This can never become a bargaining chip, if the agreement on nonproliferation of nuclear weapons is to be followed. When it becomes possible to make political capital out of old and other people's nuclear weapons as an ante, we will have taken the wrong road. Here the world must exert all its pressure. This is not a question of give-and-take. In the long run, such a stance could pull the ground out from under the nonproliferation agreement, and we would be giving support to a whole new nuclear weapons controversy in Europe.

### European 'Nightmare'

93EN0453Z Oslo *AFTENPOSTEN* in Norwegian  
29 Apr 93 p 15

[Article by Ole Mathismoen: "Environmental Legacy—Europe's Nightmare"—introductory paragraph in bold-face as published]

[Text] Every single week since the fall of the Iron Curtain, there have been new revelations about the environmental crisis in Europe. The ghastly truth about Communism's legacy is being steadily unveiled. The health of the population worsens; nature has suffered long-term and irreparable damage. The West is virtually powerless.

This week, environment ministers from all over Europe will gather in Lucerne, Switzerland. On the agenda is the

environment crisis in the East. The case documentation is too enormous to distribute. The list of crises is extremely long.

The ministers will adopt a plan of action and they will inform one another of how critical the situation is. But, in reality, they are virtually powerless. The price tag for the cleanup is so high that it will take Europe many decades to accomplish what is necessary.

The ministers will ultimately accord the highest priority to the pollution problems which threaten people's health or which leads to irreversible damage to the environment. The problem is that in most cases, regional and national environmental crises in Russia and East and Central Europe will fall under both these categories. In Poland, at the present time, only .3 percent of the water found in nature is potable without a risk to health. A high percentage of the fresh water is of such poor quality that it is unusable even for industrial purposes.

Since the fall of the Iron Curtain, air pollution has dropped somewhat. Among other things, the emission of CO<sub>2</sub>, the gas responsible for the greenhouse effect, has been reduced by as much as 20 to 30 percent in a number of countries. This drop has nothing to do with CO<sub>2</sub> emissions or regulations, but with dismantled industries and steeply curtailed oil and coal imports. It is the biproduct of a deep economic crisis. None of these countries would hesitate an instant to increase their emissions should the opportunity arise to reopen the factories or increase their energy import.

#### Must Pay Their Own

In the program of action the ministers will adopt, the principle that the polluter must pay is reiterated. Environment Minister Thorbjorn Bentsen said recently that one could not get around the fact that the individual nations have the primary responsibility for financing the cleanup. "But, naturally, all would contribute to solving the problem in situations where pollution crosses national borders," he said.

In this statement and in other similar statements from the Western governments, a clear tendency emerges: The West recoils at the thought of assuming the burden of cleaning up Communism's environmental legacy. We do not have money for it. What we would like to assign high priority to is the reduction of pollution sources which threaten Western Europe.

During the meeting in Switzerland, Norway will explain that we will allocate 50 million kroner for various projects in the East. We will also contribute 4 million kroner out of a total of 200 million that the EC Commission, OECD, and the World Bank feel is necessary to formulate a good overview and to prioritize the agenda of projects.

Apart from the millions just mentioned, little in the way of funds will be placed on the conference table in Lucerne. And as is well known, without funds, little cleanup will take place.

#### A New Problem

The Lucerne meeting will serve as a new reminder that the crisis increases day by day. The ministers of the Eastern countries will say once again that they are powerless, and that just to cleanup the remains of the Soviet Army camps in Central Europe will cost their national budget many times over.

Their industries continue to use more than double as much energy to produce an item as do industries in the West, and they pollute in the process. Furthermore, they have a new problem—Western interests which cynically exploit the need for jobs and cash in exchange for doing what they like with the environment. One example is the timber company that was driven out of the rain forest because of adverse publicity and which has now begun to prey upon the vulnerable evergreen forests of the Siberian taiga.

## SWEDEN

#### Urban Pollution Causes Allergies, Cancer

93WN0394A Stockholm DAGENS NYHETER  
in Swedish 7 Apr 93 p 5

[Article by Gosta Karlsson: "Big City Air Causes Allergies"]

[Text] It is estimated that polluted air in big cities causes about 800 cases of cancer in Sweden every year. Cutting emissions of carcinogens in half by the year 2005, as ordered by the Riksdag, will not be enough to wipe out the "urban area factor" in cancer statistics.

So says the National Environment Protection Board (SNV) in a new report entitled "*Miljostörningar och halsa*" ("Environmental Disturbances and Health"). Emissions of gasoline and diesel exhaust in particular increase the risk of cancer.

The sulfur dioxide level in urban air has declined noticeably in recent years, while the health risks related to ozone near the ground, hydrocarbon, nitrogen dioxide, and so on, remain unchanged. From 3 to 4 percent of the population in the country's built-up areas—around 300,000 individuals—is exposed to nitrogen dioxide levels exceeding the SNV's guidelines.

Researchers have found that a special "urban area factor" is also involved in the appearance of allergies. The fastest increase in allergies is currently occurring in the cities, even though the best-known allergens—pollen and fur-bearing animals—are encountered more frequently in the countryside. Stress and air pollution are

assumed to be contributing factors. It is well known, for example, that ozone and nitrogen dioxide can cause asthmatic allergies.

"From 20 to 30 percent of Sweden's population currently suffers from allergy symptoms in some form. If the rate of increase is not checked, one out of every two people will soon have an allergy," says the SNV in its report.

Mercury, lead, and cadmium are the major threats when it comes to environmental pollution by toxic metals. The margin of safety as far as the harmful effects of cadmium are concerned is too small for some portions of the population, the SNV says. Among other things, it draws attention to a recent Belgian study showing a clear connection between kidney damage and a cadmium-polluted environment. "The exposure levels having an effect were considerably higher than those existing in Sweden today."

Emissions of mercury are now declining in our country. The problem is that large quantities have already been deposited in the soil and water and are being taken up into the food chain. Added to that are the amounts arriving from far away due to emissions in other countries. The consequence is that for a long time to come, we are going to have high mercury levels in fish, for example.

"Miljostörningar och halsa" was compiled by the SNV in cooperation with the National Food Administration and the Central Bureau of Statistics.

#### Environmental Laws Often Conflict With Trade

93WN0394B Stockholm DAGENS NYHETER  
in Swedish 17 Apr 93 p 36

[Article by Lars-Ingmar Karlsson: "Environmental Requirements Disturb Trade"]

[Text] International environmental requirements often conflict with international trade agreements. If the world's environmental problems are to be solved, it will therefore be necessary to renegotiate the trade agreements.

That was one of the conclusions mentioned when the government's Environmental Advisory Committee held a conference in Stockholm on Friday [16 April] concerning the economy, trade, and the environment.

"In trade circles, one sometimes hears it said that environmental requirements could be a threat to the free trade that has been achieved through negotiation over the past 40 years. But there is no true free trade today," said Stefan Nystrom, an economist in the Ministry of Economy. He pointed out that there is a ban on trading in narcotics and atomic bombs, for example.

Environmental requirements, both national and international, create obstacles for trade in many ways.

"Many developing countries regard the requirements established by the developed countries as a new form of colonialism because those requirements are unfavorable to them," said Nystrom.

#### Price of Environment

The question is how environmental requirements can best be reconciled with international trade. If environmental costs were included in the price, the problem would be solved. But they seldom are today.

On the other hand, when individual countries decide to introduce rules entirely on their own, things often go wrong, said Thomas Andersson of the Industrial Research Institute.

"That can make the damage worse. Such measures can be used by strong special interests in industry, for example, to protect their own interests. Environmental advocates are often too weak to stand up to them," he said, and then continued:

"Small countries also find it hard to hold their own against big countries. In a worst case scenario, that can lead to a trade war."

Cooperation and international agreements are therefore needed. In part, that means getting the international free trade organization GATT to pay more attention to environmental problems.

GATT today is very rigid. Countries that want to maintain a good environment must meet very stiff requirements if they are to be able to reject a product they consider dangerous to the environment.

#### Problems Will Increase

There is a further important condition: Measures can be adopted only if the products in question can do harm within the country itself. Since today's environmental problems are international in the highest degree and far from being always due to the products themselves, that is a major restriction.

"Today the ecological boundaries are shrinking. Problems that were once far away have now come closer. At the same time, society's freedom of action is being reduced. If we do not take appropriate steps, we will lose our freedom to choose. That is how one must view the problem," said Carl Folke of the Beijer Institute.

#### Pollution Fees System Working

93WN0401B Stockholm DAGENS NYHETER  
in Swedish 18 Apr 93 p 14

[Article by Lars-Ingmar Karlsson: "Environment Fees Profitable Business For Society"]

[Text] Pollution fees reduce emissions and lead to a better environment. This was indicated by three studies by the Environmental Protection Board.

The studies were on nitrogen oxide fees, the sulfur fee, and environmentally classified diesel fuel.

Last year a fee was levied on nitrogen oxides that are released at large incineration plants. The fee is 40 kronor per kilogram nitrogen oxides. The fee has helped reduce emissions by just over 30 percent.

"The benefits to the economy are estimated to be at least 220 million kronor per year," researcher Hans Bergman said.

The system is designed to favor those furnaces that clean the best. These are repaid some of their fees, while the big polluters forfeit their fees.

Last year about 100 million kronor was redistributed and 110 thermal power plants received money back.

The new environmental classification of diesel fuel caused so-called environmental diesel to increase its share of the market from 25 to 75 percent last year, at the expense of ordinary standard diesel.

Environmental diesel has a tax reduction that goes to the producer. The idea is that all categories should cost the same to the consumer. Because of favorable crude oil prices last year, the intermediate class (environmental class 2) was even somewhat less expensive than standard diesel last year.

According to Bergman, the tax break is economically justified in heavily populated areas. The number of cancer cases drops, corrosion both inside and outside is reduced, and acidification is also lowered.

The sulfur tax on oil (30 kronor/kg sulfur) was introduced in 1991 and during that year sulfur emissions from oil were reduced by 30 percent. That represents 10 percent of the total sulfur emissions in Sweden. According to researcher Hans Jornstedt, the reduction was a result of the sulfur tax.

At plants where cleaning facilities have been put in place, part of the fees can be recovered. Much of the reduction has been produced by burning oil with a low sulfur content.

#### **Sweden Lags Behind in Environmental Initiatives**

*93WN0401A Stockholm DAGENS NYHETER  
in Swedish 18 Apr 93 p 7*

[Article by Erika Bjerstrom: "Sweden Has Become a B-Team In The Environmental League"]

[Text] "Sweden is no longer a model of environmental policy." World Watch Institute researchers made this short and sweet announcement when they were in Sweden recently to make public their new report entitled the "State of the World."

A lack of environmental initiative has relegated Sweden to the B-team of the Western world.

Even France has more far-reaching environmental proposals than Sweden.

This is true in the area of garbage, where France has decided that the country's 6,700 garbage dumps will be closed by the year 2002.

The Swedish garbage plan, according to which all households should sort their own waste by 1994, will not be carried out. The Environment and Natural Resources Ministry has not pressured local governments to indicate how they intend to achieve this goal.

Other examples of how Sweden has been passed are Germany's waste plan, Japan's energy efficiency, California's plan to phase out gasoline-driven automobiles, and Danish and Dutch efforts in wind power.

#### **Passive and Outdated**

Environment Minister Olof Johansson has completed half his term in office and is receiving little applause for his efforts to date. "Passive, unimaginative, and outdated," is the verdict from both industry and environmental organizations.

Last spring Information Secretary Reidar Carlsson issued an internal directive within the Environment Ministry: "It is time to crush the myth that this is a passive ministry," he wrote. But this has proven difficult.

The Federation of Swedish Industries is yearning for former Environment Minister Birgitta Dahl.

"She was clear with her demands, took great pains to maintain a dialogue with us, and understood the importance of a strong industry. Olof Johansson does not talk to us and does not care at all whether or not we have any industry," Environmental Director Lars-Gunnar Larsson said.

#### **Trembling Voice**

That is a remarkable statement for those who recall the battles Birgitta Dahl had with industry in which she, her voice trembling with indignation, accused it of evading its environmental responsibility. Afterward, however, more and more people have begun to view her time in office in a positive light. She was quite active in negotiations to achieve international environmental agreements. Unlike the Center Party, the Social Democrats have a tradition of international cooperation. Two of Dahl's most controversial decisions, to limit chlorine emissions in the pulp industry and for Sweden, as the first country in the world, to eliminate ozone-destroying chlorofluorocarbons (CFC), proved to stimulate development and to be favorable to industry.

#### **Simpler Then**

The Swedish paper industry has been in a good competitive situation in Europe, since it was able to deliver

chlorine-free paper at an early stage. Electrolux got an early start with its low-freon refrigerators.

But Hakan Nordin, environmental consultant for a number of companies, believes it is not Birgitta Dahl that business misses, but rather a time in which the classical environmental issues, such as smoke from industrial stacks, were the center of attention.

The policies of the nonsocialist government and the economic downturn are now changing the environmental playing field.

"Things were simpler then. Industry negotiated with the government over how many kilograms it could release, based on what was technically feasible and economically reasonable. This cooperation was fruitful, even though the cleanup of Swedish industry has been too slow. Now life-style issues have come into focus. Millions of products are, in themselves, hazardous to the environment. Now the government is trying to regulate the market itself, based on how goods and services are delivered from an environmental standpoint."

Nordin believes that the criticism of Olof Johansson is due, in part, to the fact that new times demand a new type of environmental politician.

"It is unclear what role the environmental politician should play today, now that the job no longer involves setting limits on emissions. It is possible to use mild means of control to guide consumers toward more environmentally friendly behavior, such as using environmental markings on products."

#### Bridge Illegal

The environmental movement criticizes the government's lack of an overall view. One hand does not know what the other is doing.

Olof Johansson is part of a government in which Communications Minister Mats Odell is presenting an infrastructure position that would invest twice as much in highways, 60 billion, as in railways.

Prime Minister Carl Bildt said that his "ambition is to have a bridge built across Oresund," while the Franchise Board for Environmental Protection, the nation's top environmental authority, has said that the bridge is illegal. The bridge cannot be constructed without conflicting with Riksdag's established environmental goal of reducing emissions, according to the Franchise Board.

"Olof Johansson has a difficult seat in the government. The Finance Ministry is extremely strong. It is understandable that the desire for creativity on the part of him and his colleagues has declined after they have run into a brick wall so many times," said Ulf von Sydow, chairman of the Swedish Society for the Protection of Nature.

He is critical of the Liberal Party which pushed environmental issues while in opposition, but has remained

passive while in the government. The Conservatives, too, made far-reaching environmental demands concerning a carbon dioxide tax while in opposition. It was at the initiative of the Conservatives that Riksdag decided in 1988 to set a ceiling on emissions. In several party motions in 1990 and 1991 the Conservatives called for sharply increased carbon dioxide taxes and demanded that power plants and electricity-intensive industries not be exempt from the carbon dioxide tax.

Once in the government, however, they no longer wanted to push a tougher carbon dioxide tax. In a year and a half, two major environmental proposals have left Johansson's desk: the recycling proposal and a climate proposal.

#### Everyone Disappointed

The first Swedish proposal for a joint strategy to reduce the emission of greenhouse gases was a disappointment to everyone, including Olof Johansson. When he presented it, he stated outright that he was not proud of it, but that there was little sympathy within the government for tougher requirements on the carbon dioxide tax.

Several proposals from the Environmental Protection Board got lost along the way:

- Measures against company cars and travel allowances that promote use of private vehicles.
- Providing electric-powered home appliances with obligatory energy declarations.
- Energy usage standards. Instead, the government decided that it would follow the EC in this area.

The Environmental Protection Board also proposed that products be marked if they affect the ozone layer. This proposal was also eliminated.

Not even the proposal to let the Franchise Board test companies' carbon dioxide emissions was included, even though the idea was both creative and cost effective. (The Environmental Protection Law makes it possible to view carbon dioxide as a pollutant, so that limits could be placed on the energy usage of industries at the same time that other emissions requiring permits are renegotiated.)

The recycling proposal was delayed almost a half year. A week or so after the proposal was made, Federation of Swedish Industries lobbyist Bengt Jobin was interviewed in the magazine NY TEKNIK.

When asked if the proposal had been delayed because of his lobbying work, he said, "We would like to believe so. Another reason may be that the other coalition parties do not want to give the Environment Ministry and the Center Party too much influence.... Sweden should not try to lead the way in waste treatment.... We just want profitable and reasonable solutions."

What he means is incineration instead of recycling.

Jobin's comment that the coalition parties did not want to give the Center Party too much influence is a key statement. Olof Johansson makes no secret of the fact that he believes his hands are tied.

But Johansson has never been turned down by Riksdag. His ideas are always stopped at cabinet meetings.

In the vacuum that has arisen, it is not surprising that those involved in environmental issues have turned to an intense lobbying effort, since the nonsocialist parties have openly demonstrated their disunity.

#### Weak Measures

The recycling proposal contains a timetable for recycling paper, plastic, and aluminum. The proposal has been praised because it sets a new direction, but it has been criticized for being too weak.

For example, the proposed deposit system for nicad batteries was eliminated under pressure from the industry, even though no other country has managed to collect batteries of this type without financial incentives.

New waste issues—electronic equipment such as discarded computers and junked tires and autos—are not mentioned. In Germany and Japan, 85 percent of all cars must be made of recyclable parts.

The government's proposal that a separate recycling agency be established has also come under fire.

It would be better to give more resources to existing environmental agencies, according to independent Riksdag member Annika Ahnberg (former Liberal), who made a motion that the proposal for a new authority be dropped.

#### Vital Efforts

It is out in the country's municipalities that vital environmental work is being done. A number of local governments are pioneers, and their efforts in solar power, wind power, recycling, and concrete consumer advice as to which products are environmentally sound are inspiring.

The government has placed a great responsibility on local communities by requiring them to submit plans for meeting the requirements of Agenda 21, the major environmental document from the United Nations environmental conference in Rio. These plans must be completed by 1996.

The disunity of the nonsocialist parties over environmental policy has had a price. In the absence of strict resolutions, overfertilization of the Baltic Sea, acidification of forests in southern Sweden, and increasing traffic continue. A future scenario from the Environmental Protection Board entitled "*Hur mar Sverige ar 2020?*" ["What Will Sweden Be Like In 2020?"] offers a frightening picture of nature if a number of environmental reforms are not implemented.

To quote Karl-Erik Lagerlof, the writer on cultural matters, nature is not a negotiating partner who can be compelled to put up with its diseases until the politicians are ready to act.

#### Ecological Groups in Conflict With World Bank

93WN0410B Stockholm DAGENS NYHETER  
in Swedish 24 Apr 93 p 18

[Article by Gosta Karlsson: "Environmental Groups Want World Bank Funds Cut"]

[Text] The Swedish environmental movement is demanding that Sweden cut its contribution to the World Bank as a protest against the bank's support of "development projects" that lead to the forced resettlement of millions of people and ravage instead of protect the global environment.

The "catastrophe bank" is what the World Bank is called in a recent report written by Goran Eklof of the Environmental League. The report was presented Friday at an international seminar in Stockholm on the bank's environmental policy. The report describes a number of notable projects in which social misery and widespread environmental damage have followed in the wake of the bank's investments.

One of them is the Narmada project in India, the gigantic irrigation system with more than 3,000 dams and 80,000 kilometers of canals that uses the Narmada River as the water source. The World Bank has granted the Indian Government a loan of \$450 million for the project. According to the environmental movement the development plans mean that 1 million people will be forcibly resettled and 200,000 hectares (2,000 square kilometers) of good agricultural land and 350,000 hectares of woodland will be submerged.

A local opposition movement, the Save Narmada movement, has been trying to stop the project for several years. In 1991 the movement was awarded the alternative Nobel prize, the Right Livelihood Award, for its struggle. The World Bank was influenced by the criticism and appointed a commission that year under the leadership of Bradford Morse, former head of the UN Development Program, UNDP, to study the consequences of the Narmada project. In its report the commission sided with the critics. But the World Bank announced that it would stand behind the loan for the project anyway.

The Swedish environmental movement concedes that in recent years the World Bank has done a lot of work on reforming its environmental policy—"the work has resulted in some of the best documents in the branch." The problem is that these documents have no effect on the bank's practical activity. "The directors continue to approve new projects that are obviously contrary to the bank's own guidelines on environmental protection, the rights of indigenous populations, and population resettlement."

The Society for the Conservation of Nature, the Environmental League, Friends of the Earth, WWF [World Wildlife Fund], and the Swallows, the underdeveloped countries' association, support the demand that the Swedish Government reduce its contribution to the World Bank as a protest and a means of exerting pressure for a better environmental policy.

But the demand did not have the backing of Third World Network, TWN, a federation of around 100 environmental organizations around the world. TWN's representative at the Stockholm seminar pointed out that cutting the contribution to the bank would also hurt a number of good development projects that are needed in poor countries.

#### Environment Minister Defends Government's Policy

93WN0410A Stockholm DAGENS NYHETER  
in Swedish 26 Apr 93 p 9

[Article including interview with Environment Minister Olof Johansson by Erika Bjerstrom; place and date of interview not given: "Dangerous Compromises"—first paragraph is DAGENS NYHETER introduction]

[Text] The constant compromising on the environment within the government involves a risk for both the Center Party and Olof Johansson personally. But leaving the government is no solution. Without the Center Party in the government, environmental efforts would move in the wrong direction and the Oresund bridge would be built, the environment minister told DAGENS NYHETER.

Olof Johansson is irritated by the criticism that he is passive. In last Sunday's "Insight" column various environmentalists criticized him for having demoted Sweden to the Western world's second string with respect to environmental initiatives.

"I want to be honest as a politician and have no intention of toning down any signals," was his explanation of why he openly voices his displeasure every time he runs into obstacles within the government.

"The demands of what needs to be done for the environment are so great. My message to the public is that they can vote for parties capable of dealing with the lofty ambitions. There is no parliamentary pressure for radical environmental measures just now. But my strategy is to push developments in the right direction. The Oresund bridge was moved along by an unholy alliance between the Social Democrats and the nonsocialist parties. I will present the political situation we have now. The voters must then take the political stands taken by the parties into consideration when they go to the polls."

[Bjerstrom] According to your own survey the environment is the only issue the public associates with the

Center Party. Doesn't the compromising within the government involve jeopardizing the Center Party's identity?

[Johansson] I am aware that I am running a risk as party leader. I am also running a risk within the Center movement because I do not appear enough in my role as party chairman. I am seen mostly as the environment minister. But environmental work is still going in the right direction. If I said we can't be bothered, it is too hard, and pulled out of the government, the Oresund bridge would be built and everything would move in the wrong direction. So why should I capitulate? What good will that do the voters? I compromise on time, but not on issues.

He does not understand the criticism that Sweden has lagged behind in West European environmental work but simply cites the carbon dioxide tax as one example where Sweden is in the forefront. He feels Sweden cannot get too far ahead of other countries for reasons of industrial competitiveness.

"We are behind Germany when it comes to waste, but we will catch up. We have chosen two different systems, the future will show which is best."

#### Grotesque Comparison

He also dislikes being compared with former Environment Minister Birgitta Dahl.

"People act as if environmental activity began with Birgitta Dahl in the mid-1980's. It is grotesque to compare me with her, she held this post for nine years. I have been here for one and a half. It takes a much longer time in the environmental area if one concentrates on changes in the system and not just on specific efforts."

Johansson takes issue with his government colleagues on one point. He does not agree with Communications Minister Mats Odell when it comes to concentrating on highways.

"The Environment Ministry's analysis of the infrastructure bill shows that 47 billion kronor is designated for highways. But spending that much for this purpose is out of the question.

"We have a different orientation than the Communications Ministry. We do not believe we need a lot of superhighways. We have said that it should be possible to go down to roads that are 13 meters wide. But here the Environment Ministry is up against the Highway Administration and the Communications Ministry. The allocation must still be decided."

Minister Johansson would not say whether he will stay on as environment minister in the next election period.

"Our electoral base is too small to enable us to push our environmental policy through. My job is to increase the Center Party's influence in Swedish politics. This chair,"

he said, referring to the environment minister's post, "can be filled by many others."

## UNITED KINGDOM

### **Sewage Sludge Biocombustion Process Developed**

*BR0505085993 Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 9 Apr 93 p 9*

[Article by Wim van Wijk: "Expensive Incinerator Possibly Already Outdated; British Discovery of Biological Processing Too Late for Dordrecht Sludge Incineration"]

[Excerpts] Dordrecht—While the finishing touches are still being put to a modern incinerator for sewage sludge in Dordrecht, British Professor John Pirt is proclaiming that the sludge can be degraded biologically. Despite this, Director A.R. Bresters, owner of the cooperative body which is exploiting the new incinerator in Dordrecht, denies that the 150-million-Dutch-guilder investment in the sludge incinerator was premature. "Biological processing is interesting, but is still at a very early stage. The method is not yet suitable for large-scale sludge processing."

In Dordrecht, they are refusing to believe that John Pirt, a British professor of microbiology, has found a viable alternative to sludge incineration. Pirt recently published a report entitled "Total Biocombustion of Sewage Sludge by the Biocycle Process," in which he reported that 96 percent of sewage sludge can be biologically degraded at high temperatures. For years, his coresearchers at home and abroad have been searching such a method in vain.

Bresters said, "We will have to wait a few years before we know whether Pirt's method can be used in large installations." Because our country [the Netherlands] has a very large amount of sludge to dispose of, the most modern incineration methods are necessary, according to Bresters. DRSH has already ensured that its new installation, with a capacity of some 230,000 to 240,000

tons of sludge per year, conforms to the strict 1989 Incineration Directive. [passage omitted]

### **Celebration Disrupted**

Prof. John Pirt, who has been associated with King's College in London for many years, believes that he has discovered an appropriate bacteria for the process in horse manure. His purification process consists of four stages, during which the bacteriological "combustion" occurs at a temperature which switches from 80 to 37 degrees Celsius consecutively. Thus, the bacterial growth which appears during one phase is annihilated during the following. Bacteria which are active at the high temperature must be completely inactive at the lower one. "Only in this way can one bacteria break down another one, which during the previous phase had been able to increase tremendously," according to Pirt.

It was just that problem that his colleagues had been unable to solve. Initially, Pirt was unable to do so either, even though he was employing a two-phase process using a high and a low temperature. He was left with a large amount of undegraded material. Then, however, he decided to reintroduce the residue into the process in a sort of recycling stage. In this improved approach, it appeared that the solid particles were deposited on the bottom and the clear water could be siphoned off. Pirt then brought the remains of the solid particles back into the cycle together with "fresh" sludge.

According to Pirt, the new process has many advantages. It is not necessary to dehydrate the sludge. The process also ensures that germs and parasites are killed during the first phase. Pirt has concluded from calculations made by a local engineering firm that his process will be 40 percent cheaper than incineration. An additional advantage, according to Pirt, is the concentration of minerals which remains on the floor of the reactor. "Almost all the minerals remain in the reactor and can be recovered."

Pirt is convinced that the biological processing of sewage sludge is economically viable for purification plants, which must be able to process the sewage for 100,000 people. Pirt has already convinced the North West Water Board [in the United Kingdom] of his idea. "I expect my first plant to be operational by 1995," said Pirt.

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